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The Table of Contents will be found at the end of the reading matter, page 44. Advertising Rates, page XI.

THE London *Graphic* presents an illustration of an impossible hydraulic nozzle at work at a hopeless task, with a rash manipulator in a position which would be embarrassing should the machine "buck," and then gravely describing the illustration the method of "hydraulicking," says:

Under the above somewhat barbarous title ["hydraulicking"] a method has been suggested—which we understand is in actual operation—for loosening the auriferous strata in the South African gold-fields. Such a plan, of coure, is only feasible where there is an abundant water supply available, and where, moreover, the source of the water is at a considerable height, so that great pressure is attainable.

It is wonderful how news spreads in these days of rapid communication and general enlightenment!

THE LARGEST ORDER FOR MINING MACHINERY YET BROUGHT HERE.

In another column we publish particulars of probably the largest order for mining machinery that has yet come to this country from South America. It is not, however, certain that these orders will all be filled here. Unfortunately, the freight rates charged by the Pacific Mail Steamship line to Panama are so high that most of the American goods destined for the west coast of South America have to be shipped to England and thence to destination, and the disadvantage we labor under is due to the fact that we vigorously exclude by excessive tariff charges the raw products of the South American countries, and there is, consequently, little freighting direct between the countries. The distinguished American engineer who has charge of the purchase of this great plant, and who went to South America a few years ago an ultra-protectionist, has returned ardently in favor of the free admission of at least raw material, saying that after visiting Europe and all parts of South America, he is convinced that this country can compete with any other part of the world in supplying manufactured goods, machinery, etc., provided raw materials are admitted free. The country that takes what the Mexican and South American countries have to sell, —that is, chiefly raw materials,—will naturally supply those markets with manufactured goods. This view is undoubtedly sound as well as patriotic.

THE SUPERINTENDENCY OF THE COAST AND GEODETIC SURVEY.

President HARRISON, in nominating THOMAS C. MENDENHALL to be superintendent of the United States Coast and Geodetic Survey, has indicated the appointment of a worthy successor to the distinguished scientists, beginning with HASSLER, followed by BACHE, PEIRCE, PATTERSON, and HILGARD, who have honored that office. Professor MENDENHALL was born near Hanoverton, Ohio, in October, 1841, and having a natural fondness for mathematics and physics, acquired a knowledge of these branches by himself. In 1873, he was called to the chair of Physics and Mechanics in the Ohio State University, which he held for five years, and then went to Japan, where he organized the special course of physics and the physical laboratory of the Imperial University in Tokio. He returned to the United States in 1881, and resumed his chair in the Ohio State University. The Ohio State Weather Service was organized by him in 1882. He served as its director until 1884, and he was the first to devise and put into operation a system of weather signals for display on railroad trains. He entered the United States Signal Service in 1884, and was charged with the organization and equipment of a physical division in Washington with the introduction of systematic observations of atmospheric electricity, and with the investigation of methods of determining ground temperatures. Professor MENDENHALL was the first to stablish stations in this country for the study of earthquake phenomena, and immediately after the Charleston earthquake in August, 1886, he visited that city, and made a report upon the agitation, with a co-seismic chart of the disturbed area. He was called to the presidency of the Rose Polytechnic Institute in Terre Haute, Ind., 1886, and has since filled that place. Professor MENDENHALL was elected a member of the National Academy of Sciences in 1887, and was chosen last year to preside over the Toronto meeting, this coming August, of the American Association for the Advancement of Science.

NATURAL GAS.

Mr. W. J. MCGEE, of the United States Geological Survey, has contributed to the July number of the *Forum* a paper entitled "The World's Supply of Fuel," which would lead the uninformed reader to think that the author proposes discussing the broad question of the fuel reserves of the world. The real subject-matter of the paper, however, is not fuel at large, coal, possible applications of carbonic oxide from limestone, or anything practical. It is an imperfect digest of the essays of the workers in the Pennsylvania gas field, put together in the shape in which the office geologist generally writes up the subjects for popular reading, much in the style of the magazine articles of some other pseudo-scientific English and American geologists and all-round technologists whom we could name, but whose corns we do not wish to tread on.

Mr. MCGEE makes a grave mistake in claiming too much for the predictions of the professional geologist. The work of the young men of the Pennsylvania Geological Survey is good and is useful; but when they attempt to predict the chances of finding gas by tapping the summits of anticlinals, they are going entirely too far. Theoretically, it could be assumed that oil, brine and gas would arrange themselves in the order of their respective specific gravities; and a popular, writing geologist would, therefore, sit at his desk and evolve a theory which would be plausible enough, and yet would not fit in with the facts. As a matter of fact, the professional "gas smellers" take very little stock in the natural-gas geologists, and do not at all rate them in the same class as artesian well specialists.

Incidentally, we think that all publications of the kind under review should be expressed in plain, straight English. No technical article should be so clumsy, pedantic and involved as to be unintelligible to the profession. To pile on big words, which look as though they were a carefully picked selection out of a dictionary, is a sign (in slang parlance a "give-away") of a poor education.

It is safe to say that any public communication of this kind ought to be perfectly intelligible to the "general reader," or at least to the professional engineer. Otherwise it is out of place, and adds nothing to our stock of information. Life is too short to translate or paraphrase heavy English.

THE EFFECT OF STRANGLING OUR MEXICAN TRADE.

A dispatch to the New York *Times* from the city of Mexico again confirms our anticipations, already confirmed by the London *Mining Journal*, as to the probability of the diversion of the Mexican smelting business from this country to England or Germany, or to English or German works established in Mexico, in the event of the reversal of the Treasury ruling, allowing the free admission into this country of certain silver-lead ores.

This dispatch states that steps are already being taken on a large scale by German and English capitalists, in expectation of the imposition of a duty on the lead in silver-lead ores, to establish important smelting works at several points in the north of Mexico, in which case not only will this country lose the profitable business that it is now carrying on in transporting, buying and working these Mexican ores, and the reciprocal commerce that arises from this traffic, but our own smelters in the Southwest will not even have the poor compensation of moving their establishments over the border free from foreign competition.

There is not the slightest doubt that if the contemplated change is made in the tariff it will play into the hands of our competitors for Mexican trade, and we shall be throwing away, for a wholly inadequate equivalent, the export trade to Mexico, which, since General GRANT negotiated the treaty of reciprocity with Mexico, has been the object of our most sagacious statesmen.

What good result can be expected from the Congress of American Nations in Washington this fall if we deliberately strangle the first steps toward an important trade with our nearest, most friendly, and important neighbor? Any extension of our foreign commerce must

necessarily be injurious to some individual interests, though the welfare of the whole country may be promoted by it, and in this particular case the advantages to the mining and metallurgical interests of some parts of this country will gain what others lose, while other industries and the whole country will be vastly benefited by the extension of our markets, which would come through the cultivation of trade with Mexico and other American nations.

RIO TINTO STATISTICS.

The question of the cost of producing copper at the largest mine in Europe, and the mine which, until recently, has been supposed to produce copper cheaper than any other and to regulate the markets of the world, is certainly one of great interest, both to our American and European competitors. The Rio Tinto, unlike the Calumet and Hecla, gives its stockholders some information concerning their property and the cost of its administration; but much complaint has been made that this information is not as full and clear as it should be, and in reviewing the company's report for 1888 we recently called attention to this fact and to the protest of the auditors concerning the inadequate amount applied to the extinction of that part of the "improvement account," known as the "removing overburden" and "extension and development accounts." Like a good many companies in this country that want to make a show of economy in a balance sheet, a large amount expended in stripping and other necessary mining work is counted as "improvement," and is charged up to capital account, leaving the working expenses apparently very low and the profits very large. This method of making dividends by skill in book-keeping is extremely common in railway as well as mining companies, both here and abroad. Of course the day of reckoning finally comes; and in the case of a mining company, when the mine is worked out the "improvements" cease to have any value, and the stockholders are surprised to find that the "assets" which looked so comfortable in the annual balance sheets have no value in reality.

Our attention has been directed to certain statements made in Rio Tinto reports, and we have been at some pains to analyze the accounts of the company.

The calculated columns are worthy of study! The last report of the directors for 1888 states: "The average quality of the ore extracted continues to be satisfactory." This is strictly true; but while it is true of the average (see column 14), it is not true as applied either to the export mineral (see column 3) or to the mineral for local treatment (see column 6). These figures indicate that good export mineral is getting scarcer and scarcer. The average exported annually from 1880–1882 was 262,204 tons, with 7,502 tons copper. In 1888, while there is an increase over this average of 50 per cent in the mineral exported, the amount of copper has increased only 4 per cent. An average copper content of 1·993 for export mineral is alarmingly low, even as obtained by dry assay. It might be thought this falling off in quality of export ore may perhaps be accounted for by supposing that the company was exporting to America a large quantity of sulphur ore sold only for one value and containing no copper, thus reducing the percentage of the whole; but this is not so. The published export figures for 1888 are 434,316 tons, but the chairman, in his speech, says that "393,149 tons were sold for both sulphur and copper," leaving 41,167 tons, which must be assumed was sold for sulphur only, and this export mineral has been deducted before bringing out the average 1·992. But while this low copper content is unsatisfactory for export ore, so also is the increased copper content of mineral for local treatment.

The increase shows that the ore now encountered which carries the most copper is not the cupriferous iron pyrites (peculiarly characteristic of Rio Tinto, Tharsis, San Domingo, and other such mines in that neighborhood) which is so suitable for calcining, for vitriol making, and for wet treatment either in the open or by the Henderson process, else it would be exported. It is most likely copper pyrites that is now being found in small veins in the iron pyrites, and this class of mineral is not suitable for extraction by wet methods in the ordinary way. From study of the figures the presumption is that cupriferous iron pyrite tolerably rich in copper and suitable for wet extraction is becoming scarce; the same class of mineral which has always been subjected to wet treatment locally at the mines is becoming poorer in copper than before; a considerable amount of mineral (iron pyrites) free from copper is being encountered and is being exported as sulphur ore only; and, finally, that the average copper content of the whole is being maintained at a high figure by a quantity of copper pyrites of much higher copper content than the usual class of ore, which is, or ought to be, treated by smelting and not by a wet process. The importers of pyrites for vitriol-making will not accept this class of ore.

The foregoing has a very important bearing on the question of the future of the mine, and on that of the writing off liberally, as brought up by the auditors and replied to by the chairman. If the mine has the "exceptionally long future before it" which the chairman says, there should be no difficulty in obtaining as good export mineral as hitherto. The mine depreciates in value as mineral is taken from it, and with 13,500,000 tons of mineral containing 390,000 tons of copper taken from it in the last thirteen years, the depreciation allowed for has been about £1,250,000 out of £4,500,000. At this rate of writing off, the amount at which the mines stand would disappear about the year 1924, or about thirty-five years hence. But this is not the average rate of writing off. Only in the year 1881 has any great reduction been made, and it amounted to nearly one million sterling that year. The total sum written off the mine in the seven years, from 1881 to 1888, amounts to £274,585, at which rate it would take eighty-four years yet to liquidate the amount, say about the year 1973. Can the mine possibly continue to yield upwards of 1,000,000 tons a year for eighty-four years? If not, the rate of writing off should be increased. Again, if in 1881 it was thought proper to write off the sum of £960,000 from the mine at a time when copper was worth from £65 to £70 per ton, leaving the sum at £3,605,680, it should now, when copper is worth only £41 per ton, be proper to write off one-third for depreciation in the value of the mine, apart from depreciation in consideration of the mineral taken from it. Not the least interesting figures in the table are those given in columns Nos. 7, 11 and 12, showing the total amount of copper locally treated, and the quantity sent to the waste heaps; or, as they are called for euphony in the annual reports, *Reserve Heaps*. These show that during the nine years for which we have figures the average amount of copper sent to the waste heaps is 50·5 per cent of what is treated locally. As a matter of fact, the proportion must be greater than this, because from these calculated figures there has already been deducted, as locally produced, all the copper obtained from the mine waters which does not appear in column 8. Furthermore, for want of detail in the annual reports, column 8 has been, in each year, regarded as expressing the total amount of copper dealt with, while in reality there should be added to it all the copper recovered from the waste heaps. In the earlier years, while these heaps were comparatively small, this quantity might not be great, but in later years (since 10,000,000 tons have been added to former waste heaps) these heaps ought to be yielding a large quantity of copper, if the heaps are as valuable to the company as the annual reports and accounts represent. In the year 1884 upwards of 64 per cent of the copper locally treated was sent to the waste heaps, while in 1888 the proportion appears to have fallen to 42·7 per cent; but if, for example, we suppose that in this latter year the waste heaps yielded 5 per cent of their contained copper, or say 4,500 tons of copper, then, in estimating the real quantity of copper sent to the waste heaps in that year from what was locally treated during the same period, it will be found that 56·8 per cent of it was sent to the waste heaps, while 43·2 per cent of it was recovered, in addition to the 4,500 tons, from the waste heaps. Of the copper sent to the waste heaps, a great deal is permanently lost, and, for practical purposes, what is not recovered within ten years—equal to 10 per cent of what is sent to these waste heaps per annum—may be considered as finally lost to the company. If we take 10 per cent as the yield from the wash heaps during 1888, the result would show about 70 per cent of the copper locally treated had been sent to the waste heaps. But while thus treating of the immediate and ultimate loss of copper under wet treatment, we must consider, what has already been referred to, the quality of the mineral treated.

The returns show an undoubted change in the class of mineral now mined at Rio Tinto, and, contrary to previous experience, the average copper content of the mineral for local treatment exceeds greatly the average copper content of the mineral for export. Now, if this is occasioned, as has been supposed, by the fact that only very poor mineral, suitable for wet extraction, is now being found, and with it a quantity of richer mineral, which is suitable only for smelting, it is natural to conclude that this latter mineral is being treated in the only rational way; that is, by smelting. Now, in treatment by smelting, 90 to 95 per cent of the tota copper may be recovered at once for the market, and the residual slag i not to be sent to the "reserve" heaps. It will be easily understood, therefore, that, according to the proportion of copper recovered from mineral treated locally by smelting (and from which mineral the greater part of the copper is at once recovered, none being sent to the waste heaps), the copper recovered by wet treatment will vary. If a large proportion of the ore is smelted locally and the most of its copper at once recovered, then a very large proportion of the copper in the mineral treated by the wet treatment must be sent to the waste heaps; and as the quantity of the mineral treated by smelting decreases, so must the quantity of copper sent to the waste heaps decrease; that is, under a given produce of copper per annum by both methods combined.

Notwithstanding that the published figures show, as per column 11, that during the last nine years upwards of 122,000 tons of copper have been sent to the waste heaps, the director's report for 1888 claims only 88,356 tons as thus existing, and it shows an increase over 1887 in this respect of only 5,644 tons (the copper in reserve heaps being for that year, 1887, returned at 82,712 tons and valued at £572,426, or £6 18s. 5d.

SOME RIO TINTO STATISTICS, CALCULATED FROM THOSE PUBLISHED.

1. Year.	2. Mineral exported. Long tons.	3. Copper content. Per cent.	4. Copper in the mineral exported. Long tons.	5. Mineral locally treated. Long tons.	6. Copper content. Per cent.	7. Copper in the mineral locally treated. Long tons.	8. Total copper handled. Long tons.	9. Copper produced locally. Long tons.	10. Total copper recovered for the market. Long tons.	11. Copper sent to waste heaps each year. Long tons. Or otherwise lost.	12. Per centage of the copper treated locally that is sent to waste heaps.	13. Mineral exported for sulphur only. Long tons.	14. Average copper content of the total mineral. Per cent.
1876	189,962	.....	.....	159,196	.....	.....	.....	946	.....	.....	.....	Dividends paid.	.....
1877	251,360	.....	.....	520,391	.....	.....	.....	2,495	.....	.....	.....		.....
1878	218,818	.....	.....	652,289	.....	.....	.....	4,188	.....	.....	.....		.....
1879	243,241	.....	.....	663,359	.....	.....	.....	7,179	.....	.....	.....	5%	.....
1880	277,590	2·758	7,656	637,567	2·558	16,311	23,967	8,559	16,215	7,752	47·5	8%	2·619
1881	249,098	2·890	7,200	743,949	2·703	20,109	27,309	9,466	16,666	10,643	52·9	14%	2·750
1882	259,924	2·942	7,649	688,307	2·752	18,949	26,598	9,740	17,389	9,209	48·6	14%	2·805
1883	313,291	2·610	8,177	786,682	3·093	24,338	32,515	12,295	20,472	12,043	49·5	14%	2·956
1884	312,028	2·851	8,896	1,057,890	3·347	35,407	44,303	12,668	21,564	22,739	64·2	8%	3·234
1885	406,772	2·186	8,891	954,694	3·496	33,031	41,922	14,593	23,484	18,438	55·8	5½%	3·102
1886	336,548	2·626	8,837	1,041,833	3·182	33,148	41,985	15,863	24,700	17,285	52·1	3%	3·046
1887	362,796	2·183	7,920	819,642	3·429	28,109	36,029	17,813	25,733	10,296	36·6	10%	3·047
1888	393,149	1·992	7,830	969,317	3·337	32,349	40,179	18,522	26,352	13,827	42·7	17%	2·949
Totals and averages..	3,814,577 Total, 2,911,196 since 1880.	2·509 Average.	73,056 Partial total.	9,685,316 Total, 7,690,181 since 1880.	3·144 Average.	241,751 Partial total.	314,807 Partial total.	134,323 Total.	192,575 Partial total.	122,232 Partial total.	50.5% Average.	41,167 Particulars not given	2·970 Average.

NOTE.—Column 13 would be more appropriately placed after column 4, and column 14 after column 8.
The published figures will be found in columns No. 1, 2, 4, 5, 9, 10 and 14.—The calculated columns 3, 6, 7, 8, 11 and 12 are found thus:
Column No. 3.—By direct calculation from columns 2 and 4.
Column No. 6.—By direct calculation from columns 5 and 7.
Column No. 7.—By deducting column 4 from column 8.
Column No. 8.—By multiplying columns 2 and 5 combined by 14, or by adding together columns 4 and 7.
Column 11.—By deducting No. 10 from column No. 8.
Column No. 13.—By direct calculation from columns 7 and 11.
Column 8 has to be augmented by the quantity of copper derived each year from the mine waters and from the waste heaps.
Columns 11 and 12 have also to be augmented by the quantity of copper *derived from* the waste heaps.

per ton). How this figure (5,644 tons) is obtained there is nothing in the report to show, but if we add the exported mineral for 1888, say 393,149 tons, to the mineral treated locally, say 969,317 tons, we have a total of 1,362,466 tons, which, at the average copper content of 2.949, as published, shows that 40,179 tons were handled (column 8). Of this 40,179 tons, 7,830 tons were sold as ore, and 18,522 tons were recovered locally. These together amount to 26,352 tons, and deducting this from 40,179, we have 13,827 tons of copper lost or sent to the reserve or waste heaps, yet of this only 5,644 tons are claimed in the report as having been so disposed of, leaving 8,183 tons of copper lost or unaccounted for during the year 1888. Surely shareholders must see that the careful auditing of accounts must be somewhat of a farce, so long at least as the figures representing stocks are not as carefully brought forward and accounted for as a cash balance from one year to another. The directors have, in 1888, written off depreciations in the value of the copper in the waste heaps to the extent of 13s. 8d. per ton of copper, leaving it at £6 4s. 9d. per ton. Why, seeing the necessity of this, they have not thought it equally necessary to allow an equivalent depreciation in the copper still in the mine, by more freely writing off the value of the mine, is a question that shareholders might fairly ask.

Another subject which shareholders nowadays anxiously seek information upon is the amount paid to directors in fees, etc. The reports give no details on this subject except as regards the bonus payable to them on a dividend exceeding 10 per cent. The dividend delared for 1888 amounts to 17 per cent, but in addition there is the enormous balance of £202,206 carried forward. The bonus allowance to directors is one per cent on profits over 10 per cent, and in this case it should be payable upon the £227,500 required to pay 7 per cent on the capital over and above a 10 per cent dividend, and this would amount to £2,275; but the sums actually paid, even after deducting income tax, amounts to nearly £4,000. The ordinary fees for directors are probably included in the "expenses of administration in London," which vary in amount from £8,387 in 1878 to £20,489 in 1888. The expenses of administration in Spain vary between £17,908 in 1878 and £42,612 in 1888.

If shareholders would themselves question the directors in the direction indicated by some of these remarks, if they would insist in having fuller information as to details, not only in the accounts but in the stocks, and if they insisted upon having an annual estimate given them of the mineral *proved* still to be in the mine, they would, by making the most of the figures given them, have before them all the material requisite for forming a fair and just opinion of their property.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.
All letters should be addressed to the MANAGING EDITOR.
We do not hold ourselves responsible for the opinions expressed by correspondents.

The Sylvanite Mine, Colo.

EDITOR ENGINEERING AND MINING JOURNAL:

I see in the ENGINEERING AND MINING JOURNAL of May 18th, under heading of Gunnison County, Colorado:

"Secretary Noble has denied the motion on behalf of the Sylvanite lode claim of M. Avery, and others, in the case of Charles H. Pratt, in the Gunnison County Land Office." This should read: "Sylvanite No. 2," as the Sylvanite was patented September 15th, 1882, and its survey number is 1,329. Sylvanite No. 2 has been in litigation since 1882 and has confused a number of persons at various times by being refered to as Sylvanite, leaving the No. 2 off. Respectfully yours, W. S. BAKER.

PLAINFIELD, N. J., July 4, 1889.

The Utah Mineral Waxes.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: The article on "Mineral Wax" in your issue of July 6th contains some passages upon which I would beg permission to comment. It is stated that "earth wax, ceresine, ozocerite, etc., is practically a native paraffine." Again, it is stated that mineral wax "is supposed to be composed of several members of the paraffine series, which are represented by the general formula $C_nH_{2n}+2$, and perhaps contains certain of the olefines." It is now more than 10 years since the writer presented in your columns* facts and figures conclusively disproving this view, which is the popular one, no doubt, though not shared by most competent chemists. The mineral waxes, including those of Galicia, Moldavia and Utah, are compounds of the olefine series mainly and usually altogether, and are represented by the general formula C_nH_{2n}.

In the article in your columns referred to, the writer collected together all the reliable analyses then attainable of mineral waxes from European localities, taking his figures directly from the original memoirs of the analysts, and recomputing them all, as it appeared that a number of them had been incorrectly computed on the old equivalent of carbon = 12·26 of Berzelius, which was in vogue before 1840 or 1841, previous to the accurate determinations of Dumas and Stas. All of the three older analyses cited in the article in your journal under discussion belong to this category, namely, those credited to "Malaguti" (which should be Magnus)† Schrötter and "Johnson" (Johnston). These analyses, with both the original incorrect and the correct computations, are as follows:

		Incorrect. C.	Incorrect. H.	Correct. C.	Correct. H.
Moldavian	Magnus	85·75	15·15	84·615	15·305
	Schrötter	86·20	13·77	84·43	13·69
Crude: Urpeth Colliery: Johnston		86·80	14.06	85·91	14·09

The complete and accurately computed table of analyses, as given by the writer in the article before referred to, is as follows. The dates of publication are now appended:

	Analyst.	Localities.	Dates.	C.	H.	Sums.
1.	Magnus.	Slanik.	1833.	84·615	15·305	99·92
2.	Malaguti.	Mt. Zietrisika.	1836.	85·03	13·71	98·74
3.	"	" "	"	85·03	14·19	99·22
4.	"	" "	"	84·64	13·74	98·38
5.	"	" "	"	84·807	14·138	98·945
6.	"	" "	"	84·593	14·152	98·745
7.	Schrötter.	Slanik.	"	84·43	13·69	98·12
8.	Johnston.	Urpeth Colliery.	1838.	.....	14·09	
9.	"	" "	"	.....	14·06	
10.	"	" "	"	85·554	14·06	99·614
11.	"	" "	"	83·812	13·649	97·461
12.	"	Hatchettine, from coal measures in Glamorganshire.	"	84·736	14·624	99·36
13.	Hofstädter.	Boristow.	1854.	84·94	14·87	99·81
14.	"	"	"	85·79	14·29	100·08
Mean				84·83	14·18	99·015
Mean computed to 100 parts				85·68	14·32	100·
Olefines				85·71	14·29	100·
Variation from the olefines				·03	·03	

The analysis of the Utah mineral wax, by S. B. Newberry, was published in 1879, first, I believe, in your journal.‡ The anal st apparently

*ENGINEERING AND MINING JOURNAL, April 5, 1879, pp. 234, 235, on "The Utah Ceroid Minerals."

†This Magnus analysis, the oldest on record, of Moldavian wax, is cited by Malaguti from a letter of Magnus to Humboldt, in the *Annales de Chim. et de Phys.* 1833, lx., 217. Malaguti's paper was published in the same journal, 1836, lxiii., 390.

‡ ENGINEERING AND MINING JOURNAL, March 22, 1879, p. 199.

regarded it as proving this wax to be a paraffine, but the proportion of hydrogen, 13·75 per cent, was too small even for an olefine, which requires 14·286 per cent of hydrogen, while the paraffines all contain still more than this.

It is also stated that such acids as sulphuric acid have no action on the Utah wax. As shown by the writer in his paper of 1879, this is also a mistake. To quote from that paper, he there stated that "oil of vitriol immediately and violently chars the Utah ceroid, when melted therewith, sulphurous oxide being copiously evolved, with strong white fumes, indicating formation of water." This statement is made especially to prove that the Utah wax is at least largely made up of olefines, since paraffines are not readily attacked by oil of vitriol In this it is like the European ozocerites. The writer also points out, in this paper of 1879, that the Utah material will not *crystallize* from solvents, thus varying again from the paraffine waxes.

The writer wishes also to take this opportunity to recall to your recollection that he was the first to call your attention to the Utah mineral wax, in January, 1869, he having received the first sample sent to New York, early in December, 1868, and made the first determination of the real character of the mineral. This sample I showed to you, and you inserted a paragraph in your issue of January 25th, 1879, page 55, which was very widely copied, and called very extensive popular attention at the time to the discovery. In order to put on record the names of the gentlemen who were instrumental in first bringing forward this discovery, I would ask you to insert the following correspondence:

OFFICE OF THE KNICKERBOCKER GAS LIGHT COMPANY,
No 25 PINE STREET, NEW YORK, December 5th, 1878.

DEAR PROFESSOR: Herewith I hand you a specimen of vegetable, animal or mineral matter sent to me by my brother-in-law, Col. F. Eugene Trotter, Camp Douglas, Salt Lake City, Utah.

He says of it that the people out there call it paraffine. It is a native product of the soil, crops out in veins 2 feet thick through pipe clay.

Will you be so kind as to advise me of the cost of analyzing or determining what it is, and if of any commercial value. As the matter is for a soldier, I shall be pleased to have you do it quite reasonably. With assurance of my respect. Sincerely, JOHN SICKELS.

PRIVATE LABORATORY OF H. WURTZ,
HOBOKEN, N. J., Dec. 10, 1878.

John Sickels, Esq.:

DEAR SIR:—I have taken the earliest opportunity to bestow close attention and experiment upon the interesting mineral forwarded from Salt Lake City which you transmitted to me, and find as follows:

Careful examination has left no doubt that it belongs to the class of substances known as *mineral* or *fossil wax*. These substances are found in some European localities, as in Galicia and Moldavia, but not heretofore on the American continent. In Europe they are refined, bleached, and used for making fine candles, and for other purposes as substitutes for white wax. This American variety resembles most that from Zietrisika in Moldavia, which is of the best quality. It is not in any way to be confounded with paraffine, being far harder and insoluble in some of the solvents of paraffine.

I would advise that you procure a larger quantity and institute extended and competent experiments to determine the proper modes of bleaching and refining it. Also that the extent and reliability of the formation should receive expert examination. Should these questions be favorably determined, no doubt can remain of the value of the deposit, if adequate markets exist within reach.

The material, like paraffine, is highly resistant to most chemical agents, while at the same time *much harder* than paraffine. Some of its obvious uses are for candles, water-proofing, compositions for roofing, flooring, paving and other cements, varnishes, lubricants and saturating wood for preserving and water-proofing, and for holding chemicals. These uses and others that may be suggested should receive experimental investigation.

Respectfully,
HENRY WURTZ, Ph. D.

To return again to the paper in your last issue. One statement strikes me with some surprise, namely that "The Utah deposits are larger than any yet discovered." What proof is there of this? or even of their being comparable with those in Galicia, which have yielded so enormously, as stated in another part of the article—$40,000,000 worth since 1861? Proof of such an abundance in Utah seems a matter of such monstrous importance that no stone should be left unturned to arrive at it. As the writer sets forth in the letter to Mr. Sickels, above cited, expert examination and testimony of the most competent kind ought to have been resorted to long before this. I am aware that in a letter published by you Feb. 1, 1879, the eminent geologist Dr. J S. Newberry states that "Professor J. E. Clayton described the deposit as occupying an area sixty miles long by twenty miles wide, and in some places forming a bed twenty feet thick," a statement which has been copied all over the world, and which if really attributable to such a high and unimpeachable authority as Professor Clayton, would make northeastern Utah the most valuable spot on our globe. It must be noted, however, that Professor Newberry was careful to say that he himself "did not visit the locality." It happens, moreover, that the present writer met Professor Clayton in 1879, or thereabouts, and clearly remembers that this gentleman told him that he, Professor Clayton, had been misapprehended in this matter, and that the above big figures designated merely the extent of the shale formation in which the veins of mineral wax occurred, and at that time his own knowledge did not yet allow him to speak as to the amount of wax that was attainable throughout the region. Let us hope that these doubts may now be soon cleared up.

With regard to the chemistry of the mineral waxes, the undersigned proposes, with your concurrence, Mr. Editor, to prepare some abstracts of the observations of different chemists from the bibliography of the subject; as this subject seems now to be receiving renewed attention, and justifiably so, if the alleged great abundance of these materials should be verified. Respectfully, HENRY WURTZ, Ph. D.

2142 SEVENTH AVENUE, NEW YORK, July 9th, 1888.

QUICKSILVER IN RUSSIA.

Written for the Engineering and Mining Journal by W. A. Abegg, St. Petersburg.

A bed of cinabar was discovered in 1879 by Mr. A. W. Minenkoff, a Russian mining engineer, in the Katherinoslaff Government, district of Bakmouth, about three miles east from the railway station, Nikitooko, on the Koursk-Kharkoff, Azoff line.

From want of sufficient means the mine was not worked until Mr. Alexander Auerbach, late Professor of the Imperial Mining Institution of St. Petersburg, obtained from the peasants of the village Zalzeff, the owners of the land, the right of exploitation in the beginning of 1885. He engaged Mr. Minenkoff for careful exploration during the summer.

The results being satisfactory, Mr. Auerbach was lucky enough to raise the required capital (exceedingly difficult in Russia, especially for mining affairs), and formed "The Society for the Exploitation of Quicksilver. A. Auerbach & Company, in St. Petersburg." At the end of December, 1886, all buildings, engines, etc., being ready, the works were started. The lodes discovered are from 21 to 49 feet thick, running from east to west, with a dip of 50 degrees. The quantity of ore proved by exploration is estimated to be about 194,000 tons, which, calculated at nearly one per cent quicksilver, would produce about 1900 tons of metal. New diamond drills for further exploration of the ground will soon be ordered from the American Diamond Rock-Boring Company, of New York.

The ore is raised from three shafts of 49, 98, and 140 feet deep, in which three galleries of 1120, 595, and 196 feet have been driven.

The ore bedded in coal seams is impregnated into a coal-grit; it has, however, not been deposited during the formation of the grit, but later, when the breaking-up of the beds took place.

The ore is blasted with dynamite, of which 2½ poods are employed for 1,000 poods ore raised (90·28 pounds dynamite for about 18 tons ore). Cost price of ore from Rs. 2 to Rs. 2.50 ($1 to $1.25 per ton).

The ore is crushed by a Blake rock breaker and separated into four classes:

No. 4. From 35 to 150 mm. size.
No. 3. From 12 to 35 mm size.
No. 2. Below 12 mm. size.
No. 1. The richest ore, hand-picked and crushed into 5 mm. size and less.

The cost price of separated ore is Rs. 3 20 to Rs. 4 ($1.60 to $2 per ton.)

The mine is worked through one principal shaft, with one 50 horse-power hoisting engine, one pumping engine, 40 horse-power, two Cameron direct acting steam pumps, of 40 horse-power each. The other shafts are equipped with horse whims. All these engines have been constructed in Russia, and are in every respect first rate.

All buildings are provided with electric light and tracks are laid communicating with all parts of the works.

Number and description of furnace.	Class of ore treated.	Capacity per twenty-four hours.	Number of workmen per furnace.	Fuel, per ton of ore.	Price treating the ore per ton.
		Tons.		*Pounds.*	*Cents.*
1. Idria modified by Auerbach.....	4	20	5½	80	80
2. Troug system, Auerbach.....	4	40	5½	70	66
1. Idria double reverberatory.....	3 and 2	8	7½	250	272
1. Chermak's double*	3 and 2	40 to 45	9½	88	68
1. Auerbach	1	7	3	120	80

Each furnace is provided with an outer casing of cast iron and some of wrought iron, hermetically closed, protecting the workmen against mercurial vapors.

The vapors are condensed in Chermak's cast iron condensers, which are considered the best.

Working people are paid per day—a woman 30 kopecks; a common laborer 60 to 80 kopecks (30 to 40 cents); a miner Rs. 1 to Rs. 1.20 (50 to 60 cents).

The output of the mine during the first year, 1887, was 658,411 poods (11,527 tons of 2000 lbs) of ore, separated into 16,590 poods of No. 1, about 2½ per cent, containing 4·85 per cent quicksilver; 65,844 poods of No. 2 about 10 per cent, containing 2·20 per cent quicksilver; 95,835 poods of No. 3 about 15 per cent, containing 1·23 per cent quicksilver; 460,142 poods of No. 4 about 72½ per cent, containing 0·65 per cent quicksilver, or an average of nearly one per cent quicksilver.

The works delivered during 1887, 3905 poods, or 141,009 pounds of quicksilver; in 1888, 10,060 poods, or 362,366 pounds, but with the present number of furnaces the company will be able to treat annually 51,200 tons of ore, and on the basis of the present extraction of about 15 pounds of pure quicksilver to the ton of ore, the quantity produced for sale will increase up to 22,400 poods, or 808,864 pounds per annum.

The consumption of quicksilver in Russia being about 2000 flasks of 84⅔ Russian pounds, or 76·5 English every year, the company can export nearly 18,000 pounds, says 8820 flasks per annum. Where there was no population prior to 1886, more than 1000 inhabitants are now in the neighborhood of the works, lodged in comfortable little houses.

The establishment of the works of the company, including engine and boiler houses, offices, thirty small and three large barracks for workmen, and six houses for engineers, clerks and servants, has cost Rs. 600,000—$300,000. The cost price of 1 pood (36 pounds) of quicksilver is not quite Rs. 15—$7.50, or per flask of 2 pood 4⅔ pounds (76½ pounds, English), Rs. 31.50 ($15.75), and with the selling price between £7 and £8 per flask, there are good reasons to expect good dividends in the future. These are the first and the only quicksilver works in Russia, perfectly well established and conducted, owing to the great energy, knowledge and skill of Mr. Auerbach.

* The double furnace of Mr. Chermak's is a combined reverberatory and cupola furnace.

THE SLAYBACK LODE.—A PECULIAR KIND OF FISSURE VEIN.

Written for the Engineering and Mining Journal by Carl Henrich, M.E.

Cooney mining district is located on the east side of the San Francisco River, in the Mogollon Range, in the western part of Socorro County, New Mexico. The Mogollon Range itself is in the center of the large region of eruptive volcanic rock, which forms such a prominent red spot in this region on any geological map of the United States. The main mass of the Mogollon Range, which has the reputation of being the roughest of all the New Mexican mountain ranges, is built up of successive layers of volcanic rock of various thickness and composition, in nearly horizontal beds or layers, only slightly inclined, with a gentle pitch towards the southwest; the general direction of the mountain range being northwest and southeast.

This pitch of the layers of volcanic rock holds good, however, probably only for the western slope of the Mogollon Range, the writer being unacquainted with the formation of this range on its eastern slope. The composition, color, and texture of the volcanic rocks forming these layers differ among themselves in a remarkable degree. Thick layers of light buff color alternate with thinner darker-colored layers of nearly all the colors of the rainbow. The perpendicular columnar structure of the thicker layers alternates with the thin horizontal cleavage of the thinner layers, and this is especially noticeable on the weathered sides of the cañons. Some of these latter layers, evidently intruded between the inclosing thicker layers, wedging out on both exposed visible ends at the side of a cañon, resemble so much a thinly bedded red sandstone that they are almost universally regarded as such in the district, although a closer inspection of the rock reveals unmistakably their volcanic origin.

Through these horizontal layers of volcanic rock, break dikes of a more silicious eruptive rock, which has received locally the name of quartzite, but which is in reality a feldspathic rock with a large preponderance of quartz.

These dikes run in two general directions. One system of these dikes runs in a general east and west direction, with a pitch to the north; while the other system runs a little west of north and east of south with a pitch to the east. The pitch of these dikes varies from 55 to 75 degrees from the horizontal.

Along the east side of one of these north and south dikes of silicious eruptive rock the Slayback lode crops out on the top of Sheriden Peak.

The footwall of this lode is, therefore, the eruptive silicious rock of the dike itself, while the hanging wall is formed at the outcrop of the lode by a dark purple-colored layer of the common volcanic rock of the country, full of gas holes, which are sometimes, although rarely, lined with beautiful quartz crystals.

The lode itself was evidently formed along the fissure between the silicious rock of the dike and the horizontal (or nearly so) layers of the common volcanic country rock, and must, therefore, be classed as a fissure vein.

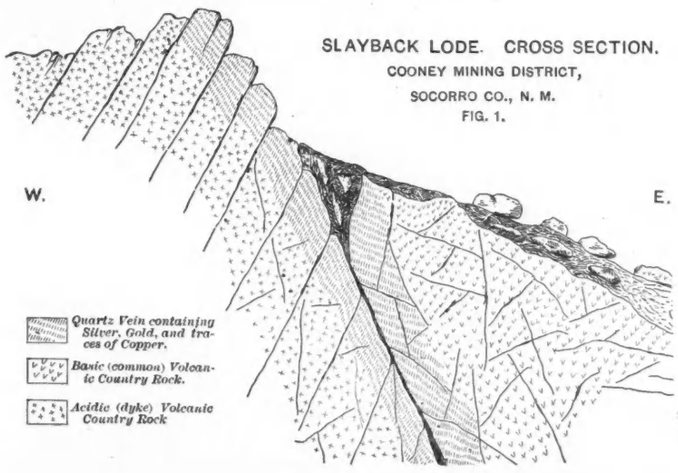
The dike itself, at least where the outcrop of this lode occurs, on the top of Sheridan Peak, has a very pronounced cleavage into nearly prismatic slabs. These cleavages run diagonally across the dike, pitching to the west at an angle of about 60 degrees from the horizontal, while the dike itself pitches with about the same angle to the east. The prominence of the dike outcrop on the crest of Sheridan Peak and of the white quartz croppings on the east side of the dike naturally soon attracted the attention of the prospector. Good assays obtained of this outcrop led to the sinking of the shaft, the so-called Meyer shaft. But in sinking this shaft and in prospecting this lode generally, the prominent cleavage of the dike led to the assumption that the dike, and with it the vein, which seemed to be the easternmost part of the dike, pitched in a westerly direction. The quartz of the croppings forming the top of some of the prismatic slabs of the dike, as shown in the cross-section of the lode (Fig. 1), changed suddenly and within a few feet from the surface.

Being puzzled by that sudden change, as was indeed natural that they should be, they sunk the shaft over 30 feet and then ran a cross cut drift 25 feet to the west to intersect the ore which they expected to pitch as the cleavage of the dike. When the writer took charge of the mine, an open cut was made along the outcrop of the vein and the ore was followed down, careful observations being taken all the time. It was found after a few weeks of working that the ore pitched to the east instead of to the west, and that there were no defined walls whatever to the lode. The fissure at the place where the Meyer shaft is sunk was found to be obliterated, being indistinguishable from one of the numerous joint seams of the quartz and country rock. Farther to the north, however, about 50 feet distant from the shaft, the original fissure was found to go down in the center of the lode, filled at that place with a ferruginous clay and decomposed sandy quartz. From this place the cross-section of the vein is taken. Fig 2 shows the plan of the lode with the workings made on the same.

We have here evidently to deal with a fissure vein, in which the vein or lode was formed by a gradual change of the wall rocks into auriferous and argentiferous quartz without any defined walls on either side. The quartz changes into the country rock in a space of half an inch to an inch, and generally without any seam, however slight, separating the quartz from the country rock. The fissure is for the greater part of the opened portion of the lode well defined, containing clay and an opaque quartz, carrying only very slight amounts of the precious metals, while both walls of the fissure are changed for some distance into auriferous and argentiferous quartz rock without any division by seam, or even by a continuous line between the lode itself and the country rock of the walls. There is not the least doubt that the lode follows the fissure between the dike and the common volcanic rock of the country and that the mineralization and vein formation must have taken place by solutions circulating in this fissure, ascending or descending—probably the former. Whether at greater depths the fissure itself is filled with quartz is so far questionable. As the outcrop and down to the limited depth obtained so far, the fissure itself carries the poorest material in the whole lode. This *may*, however, change at greater depth. The richest part of the lode, with quartz assaying up to $50 per ton in gold and silver, has been found to accompany the fissure on its foot-wall side. The width of the vein or of the body of quartz on both sides of the fissure varies from 3½ to 7 feet. This width is subject to very sudden changes, according as the prismatic blocks or slabs of the dike have been changed into quartz rock to a greater or less distance away from the fissure.

We have in this lode a fissure vein without any defined walls whatever, and in which we can still see the original walls of the fissure from which the mineralization and vein formation proceeded in their original position in the center of the vein. If the cleavage of the dike rock had taken place parallel, or nearly parallel, to the east side of the dike, one of these cleavage fissures or seams would have been recognized, and would probably have formed the foot-wall of this fissure vein, and the whole vein might then have been well regarded as the filling of a pre-existing fissure, instead, as is evidently the case, of a change of the country rock into solid quartz. In the quartz of this vein itself there is not the least indication of its being altered country rock, and only the fact that there is absolutely no division between the country rock and the quartz, and that at their junction they gradually change into one another in the short distance of a quarter of an inch to an inch, reveal the true way in which this quartz lode was formed.

The numerous veins of this district form, in their various aspects and characteristics, a very interesting field for the student of fissure-vein formation in eruptive rocks, and after a close observation of the various characters and appearances of many of these veins, anybody will be much less inclined to the view that most fissure veins are the filling of pre-existing empty spaces in fissures than that the present vein rock, in probably most cases, is the result of the gradual change of the original country rock at the side of the pre-existing, and generally still existing, fissure, even if the present vein rock should be separated from the present wall rock by a selvage or seam.



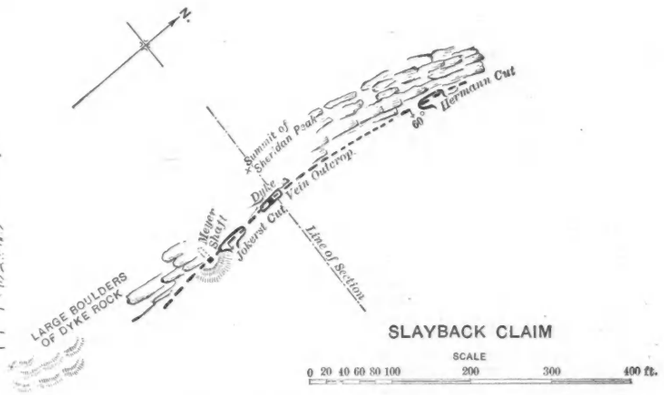


FIG. 2.—PLAN OF OPENINGS ON SLAYBACK VEIN.

THE MINING DISTRICT OF TASCO, STATE OF GUERRERO, MEXICO.

Written for the Engineering and Mining Journal by R. E. Chism M. E.

The mining town and the district of Tasco are situated in the State of Guerrero, nearly due south of the city of Mexico, at a distance of eighty-one miles, but which is increased to about one hundred miles by the windings of the roads. It is best reached at present by taking the Inter-oceanic Railroad from Mexico to its terminus at Yautepec, from which point there is a fifty-mile ride on horseback. Some thirty-five miles of this road is good enough for a carriage, if procurable, and the latter part can be made good by spending a small amount in road mending; consequently, machinery can be hauled into the camp. There is one piece of the road, say about three miles long, called the Calzada, or Causeway of Borda, which was once, some hundred and fifty years ago, a fine road, well-paved with stone. Now the

stones have become rounded by the attrition of all those years, the mountain torrents have worked their will with many portions of the roadway, and the result is as dangerous a piece of road as there is in all the Republic.

Tasco was one of the first districts in which the Spaniards worked after the Conquest. Cortez himself was said to have been interested in or to have owned a mine here, and probably the Aztecs had preceded the Spaniards in the search for the precious metals. Baron Humboldt enumerates Tasco as the center of one of the eight groups which he considered to comprise the principal mines of Mexico.

Tasco is best known in the annals of mining in Mexico as the place where D. Jose La Borda commenced his wonderful career as a miner. He was a Frenchman who came to this country in the early part of the last century to join a brother, D. Francisco La Borda, who had been working mines in Tasco for many years before. D. Jose was only sixteen years old at the time of his arrival here, and first made his fortune in the La Cañada, or more commonly known as the Borda mine in Tlalpujahua State of Michoacan, about 1743. The proceeds from this mine were very large, and Laborda built a fine church in that town, and improved the town itself considerably. Then D. Jose inherited his brother's mines in Tasco, and returning there commenced to work them. He took out about $2,000,000 from the San Ignacio mine, and built a church in Tasco at a cost of $550,000, which is probably the most beautiful one of its style in the whole republic. In his poorer days thereafter, he sold a piece of church furniture which had been returned to him, a pyx of gold studded with diamonds, for one hundred thousand dollars. With this sum he went to Zacatecas and made many millions in the San Acasio mine. His churches and the magnificent garden which he made in Cuernavaca prove him to have been a man of exquisite taste as well as splendid luck, and he is talked of in Mexico to-day as the pre-eminent type of the successful and superstitious miner. He died in 1785, leaving a large fortune. The foregoing particulars regarding his early life, different from the stories generally told, were extracted by me from a contemporary manuscript, of which I will speak further on.

The district is situated on the western slope of a chain of mountains, part of the great metalliferous interior chain which includes Zacatecas and Guanajuato in its northern extension.

The town of Tasco lies on the northern edge of the mining district. To the south the district extends some 10½ miles, to east some nine miles and to west about five miles. To the eastward of Tasco some twenty or thirty miles is the Buena Vista district, which is comparatively unknown. It is said to possess many strong veins, yet the greater part is virgin ground.

The whole of the mountain chain is cut up by tremendous gulches, which expose the veins in a very favorable manner, rendering them easy of access by deep tunnels There are also many good mill sites in the bottoms of the gulches where the ordinary torrential character of the streams can be easily restrained by inexpensive dams, which will insure a good supply of water all the year round.

The general character of the country rock around Tasco is a limestone formation such as is found in many parts of Mexico. This is underlaid by beds of clay and micaceous slate which some convulsion has exposed in the mining district. In these latter beds are found the metalliferous veins. Although the veins traverse all the formations, the silver-bearing minerals are supposed to be distinctly localized in the clay slate, and the veins are said to be either very slightly metalliferous or altogether barren where they pass into the other rocks.

With one single exception, all the veins in Tasco of any importance have a direction from northwest to southeast, between 45 and 75 degrees. The Compana vein crosses these nearly at right angles, and there are some small veins which have the same direction. If we add to these intersections those produced by the crossings of the veins of the main system, we shall readily see that the ground around Tasco is a perfect network of veins of more or less richness. The width of the principal veins is from three to nine feet the subsidiary veins are measured by inches, and all have dips which are very variable in direction and amount, mostly between 50 and 80 degrees.

The most famous veins here are the Pedregal, the Analco, the Corpus Christi, the Santa Maria, the Zumpancuahuitl, the Chocotitlan, the San Ignacio, the San Luis, Moroy Milagro, Zapote, with some others. These are mostly branches of the Pedregal, which appears to be the great mother vein of all.

The most noted mines are the Pedregal, the Zumpancuahuitl, the Chocotitlan, the Espiritu Santo, the San Pedro and San Pablo, the Ascension, the San Antonio, the Animas, the Remedios, the San Ignacio, the Encarnacion, the San Lorenzo, the Perdon, the San Onofre, the Prieta, the Galvez, the Llano and the Luz. In all of these mines the veins present the same general characteristics; the body of the vein consists of white quartz mixed with calcite and with some barite. The silver-bearing minerals are galena and zinc blende. Sometimes the galena is nearly pure in coarse crystals, when it is generally poor in silver, sometimes in fine crystals with a steely fracture. This form of galena contains a large amount of antimony and the silver is more abundant. Although the silver minerals are mostly contained in the galena and in the blende, they are often found isolated as black or ruby silver in nodules of considerable size. Native silver in its usual wire form has been found sometimes in considerable masses, and in the clay selvage which borders some of the veins and in the outcrops there are frequent specimens of chlorides and chloro-bromides. Some of the veins, especially the Analco vein, were worked as open cuts in the times whereof even tradition speaketh not. Some of these great gashes into the hill sides are like railway cuts, so wide and long and deep, and great trees grow in the rents that the hand of man has made, but of all the many thousand tons of material that were taken thence not a trace remains. It must have been practically all ore, probably mostly rich chlorides.

The water line in Tasco is not very far down. Probably it averages some 200 feet from the surface. One hundred feet below is the deepest probably that the old workers ever got, and even down to that limit they left a good deal behind them. No systematic effort on a large scale to work the mines of Tasco has been made since the beginning of the century. About all that has been done since then, in the intervals of revolutions, which have severely handled the unfortunate little city, has been to clean up the leavings of the former workers. At present almost every mine in the district is in the hands of *buscones* or ore-seekers who venture, at the peril of their lives, into the ruins that years and decades of bad work have left in the mines, and pursue every little thread and streak of ore until it becomes too poor even for them. The weekly spoils so gained are divided with the owners of the mines, who get one quarter of the extraction for their share, and the rest is sold to the highest bidder. When the *buscon* is favored by fortune and discovers some little pocket which has been overlooked by his predecessors, or which he has arrived at by persistent exploration, he is very careful to keep his find a secret or else the owner of the mine will step in to work that particular spot on his own account until the pocket is exhausted. As a consequence the total production of the camp has dwindled to some thirty tons a week which will assay on the average, say, 120 ounces of silver per ton.

No account is taken of the gold in these ores, if there is any. One of the local metallurgists said that the ores average $4 worth of gold per ton, but such a small amount goes for nothing in the patio process.

Of course the above ore is the product of selection from a much large-quantity of rock which, if not so carefully picked over, would yield a much greater bulk of ore of a lower grade. The work of selection is far cilitated by the fact that the silver minerals are generally more or less localized in spots or nodules, so that the really good part can be pretty fairly well separated without much loss to a man whose time is worth practically nothing, say $2 to $3 per week. On examining some veins on the Zumpancuahuitl and Chocotitlan properties, with a view to exploitation on a larger scale, I estimated that about one-third of the vein matter in a vein 4 feet wide is ore which will net $40 per ton.

The present price of drifting, all expenses included except general expenses, for a drift 6½ feet wide and 8½ feet high is $9.08 per foot. At that price a ton of ore can be knocked down for, say, $7.50, and brought to the surface from a depth of some 350 feet for $1 more, making $8.50 per ton on the dump. Of course, if the ore was got out by stoping, which is practically unknown in this district at present, it would cost much less, probably one-third the present price.

Nothing in the history of Mexico is more fascinating than the stored wealth of the old Spanish miners. The mint statistics glitter with the silver and gold that they wrung from mother earth when her storehouses were more accessible apparently than they are now. Ruins of a type almost as substantial as the pyramids of Egypt remind the explorer in the most hidden mountains that a mighty race has preceded him in the hunt for gold; and mysterious holes in the ground, each provided with a generous and expansive tradition, tempt the modern capitalist on every hillside. Withal we know little of how these men worked, and still less of what it cost them to win the treasure of which they seem to have had so much. Mining towns were attractive bait for revolutionists, and archives made splendid camp fires for hungry and travel-wearied troops. The archives of Tasco perished long ago in the flames of civil war, but some careful hand rescued therefrom a torn and stained manuscript yellow with age, from whose crabbed text I have deciphered some data of the years gone by.

(TO BE CONTINUED.)

SEAMAN'S UNIVERSAL ROLLS.

In the ENGINEERING AND MINING JOURNAL of June 8 we described the universal rolling mills of Hugo Sack. There has recently been patented in this country by Joseph S. Seaman, of Pittsburgh, Pa., a universal rolling mill that is especially applicable for the reduction of structural shapes. This mill has been in use in a small way at the works of Seaman, Sleeth and Black, of Pittsburgh, and also at the works of the Pennsylvania Steel Company, at Steelton, Pa., where it has been successfully used to roll eight-inch I-beams.

In it the horizontal and vertical rolls are interlocked in such manner that the inward and outward movements of the vertical rolls are controlled by the horizontal rolls in their movements toward and away from each other, and the rotation of the vertical rolls is effected by the conjoint action of the horizontal rolls. The metal is rolled in frictional contact with the vertical rolls. To effect these functions, the horizontal rolls are provided with collars having their inner faces beveled, and the inner faces of the rims of the vertical rolls are correspondingly beveled. These beveled faces work in contact with each other, the collars on the horizontal rolls serving as a backing or brace for the operative rims of the vertical rolls, which are made quite thin at their edges and merging into the beveled faces of the horizontal rolls, in order to prevent the formation of fins on the article being rolled. In spite of the firm support afforded by the collars of the horizontal rolls these thin edges of the rims of the vertical rolls are sometimes broken, rendering the roll useless for further use.

This is provided against by such a construction of the vertical rolls that the edges of the article being rolled along one side are so shaped during one pass as to avoid all liability of the formation of a fin during the next pass, or, in other words, the edges of the article along one of its sides are worked back during one pass to or approximately to or even beyond the finishing line of the next pass. Thus the formation of fins is prevented, or in case partial fins are formed during one pass they are reduced and obliterated in the next pass.

In the accompanying illustrations, Fig. 1 is a view of rolls constructed to roll I-beams, showing a portion of the horizontal and vertical rolls which are adjusted to the position they occupy at the beginning of the rolling operation. Fig. 2 is similar to Fig. 1, the rolls being adjusted together for the finishing passes; and Fig. 3 is a view, partly in elevation and partly in section, of a three-high mill embodying the invention.

The invention is described as applied to rolls for reducing I-beams, but it can be readily applied to rolls suitably shaped as regards their faces operating on the metal for the reduction of other structural shapes.

At the ends of the center portions of the rolls, operative in forming the web of the beam, are formed grooves, the adjacent sides operative in shaping the inner faces of the flanges of the beam being slightly beveled and terminating in shoulders, the length of such vertical sides being equal to the depth of flange desired in the finished beam. The operative faces of the shoulders of the upper roll are made straight or approximately parallel with the axis of the roll, and of considerable width, as they form the faces for finishing the edges of the

beam-flanges. The operative faces of the shoulders of the under roll are slightly beveled, and are made quite narrow, their width being approximately equal to half the thickness of the finished flange at its edge. This shoulder operates in the finishing passes as a fillet, and partially forms the edges of the flanges.

At the outer ends of the shoulders are formed auxiliary grooves. The walls of the groove of the upper roll, being practically a continuation of the groove, are beveled, as shown, while the inner wall of the groove, which is a continuation of the groove of the under roll, is made vertical, and its outer wall beveled at the same inclination as the outer wall of the grooves. The grooves form collars at the ends of the rolls have beveled inner faces and vertical or approximately vertical outer faces.

The vertical rolls, which are counterparts of each other, consist of disks having thickened rims. These rolls are so mounted in the housings that the rims operate within the grooves of the horizontal rolls, and the inner faces of the rims are beveled at an equal angle with the angle of the faces of the horizontal rolls.

In the construction of rolls the beveled faces, in addition to what might be termed their "driving," "adjusting" and "supporting" functions, were employed as fillets operating on the outer edges of the flanges to prevent any finning at such points, and in order that the faces might effect such function it was necessary that the edges of the rims of the vertical rolls should be made very thin and should merge into the beveled faces, thereby rendering the vertical rolls weak at places. In order to increase the strength of the edges of the rims the grooves are made considerably wider, and the rims are correspondingly increased in thickness.

As it is necessary in a mill having its vertical rolls operating between the horizontal rolls that portions of the horizontal rolls should be employed in reducing and finishing the edges of the flanges, it follows that the portions of the faces of the rims, operative in finishing the outer walls of the flanges, cannot have a length greater than the width of the flanges; or, in other words, the portions of the faces of the rims should have a length equal to the distance between the shoulders of the upper and under rolls when the latter have been adjusted in proper relation to each other for the finishing passes, so that the ends of the portions of the rims will be brought into line with the surfaces of the shoulders during the finishing passes, these shoulders being constructed to edge and finish the flanges. It follows from the foregoing that when the rolls are separated, as they are except during two or three final passes, and the vertical rolls moved outwardly, there will be open spaces between the shoulders and the ends of the portions of the rims, into which the metal could be forced and fins formed. Any metal which may be forced down beyond the portions of the rims in one pass will be forced back in the next pass by the shoulders, the beam being turned over for such pass, as is usual in the use of a two-high mill.

In order to prevent any metal being forced around the unextended edges of the rims, shoulders are formed on the extensions or additions of the rims, which project beyond the operative faces of the rims equal to or even greater than the reduction effected by the vertical rolls at one pass. As shown in the illustrations, the shoulders are entirely outside of the operative faces of the vertical rolls, which shoulders begin at the end of the operative faces or at a distance of the edges therefrom.

It will be readily understood that whenever in the rolling operation any metal is forced outwardly beyond the operative faces and within the scope of the operation of the shoulders, such metal will be forced inwardly by the shoulders to the line of finish of the next pass, and that when the beam is turned one hundred and eighty degrees and inserted between the rolls for the next pass the recesses in the beam will come opposite the open spaces between the shoulders of the upper roll and the edges of the rims of the vertical rolls, and as the depth of the recesses in the flanges of the beam is approximately equal to or greater than the amount of reduction to be effected in the pass the portions of the beams operated on by the shoulders in the previous pass will not be affected; but the other portions of the flange will be worked back to approximately the same line of finish as the bottom of the recess. In case any metal should during any of the passes be forced out between the shoulders and the edges, the metal so pressed out will be at the next pass subjected to the action of the shoulders and be reduced thereby.

The extensions on one edge of the rims, and the auxiliary grooves formed for the reception of such extensions, permit of a considerable increase in the length of the beveled faces, and in order to correspondingly increase the length of the faces the grooves are formed in the upper roll, and the rims of the vertical rolls are provided with extensions having their outer faces coinciding with the faces. It will be noticed that in this construction of rolls the beveled faces are employed solely for rotating, adjusting and holding the vertical rolls to their work.

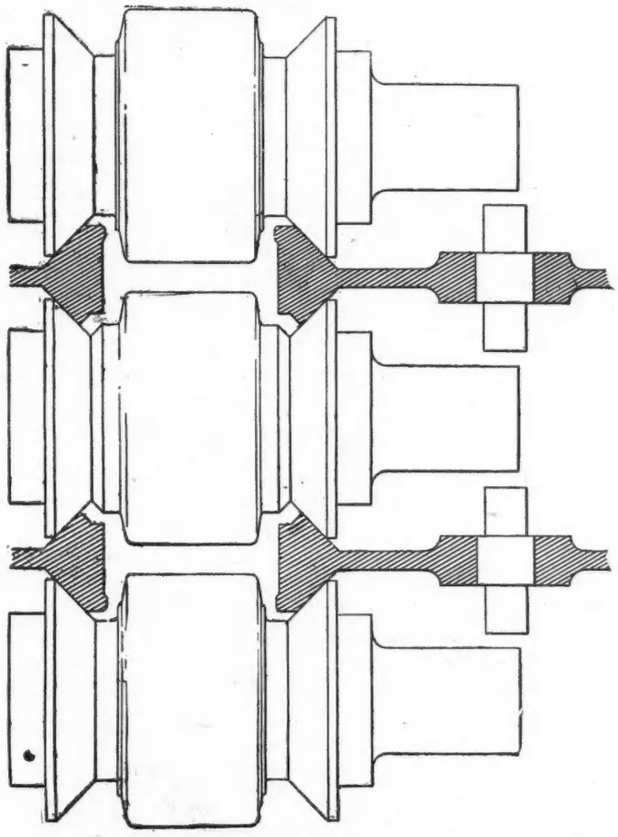


FIG. 3.

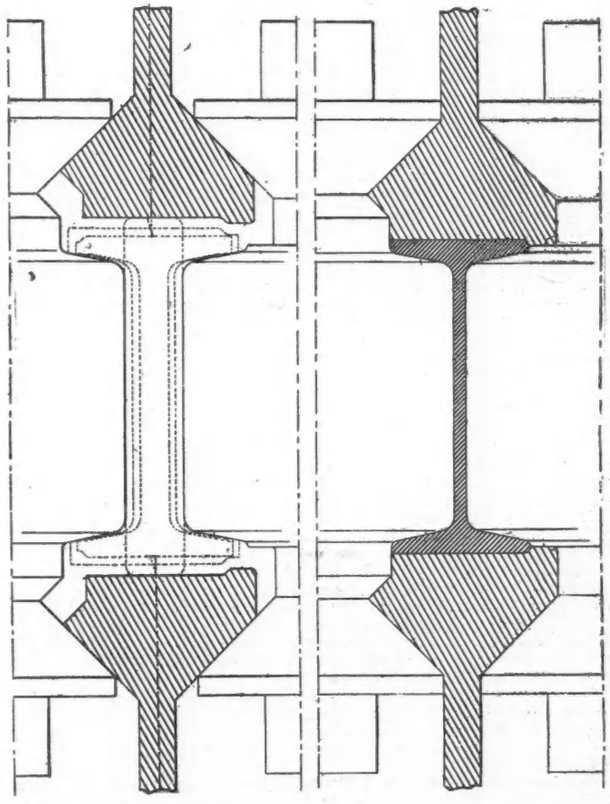


FIG. 1.

FIG. 2.

In reducing beams in this mill, the edges of the flanges are reduced and shaped almost entirely by the shoulders of the upper roll, the shoulders of the lower roll and of the vertical rolls contributing very slightly in the reduction and shaping of the flange edges, except during the last three or four passes, when these shoulders are brought together, as shown in Fig. 2. As the shoulders are beveled, a slight bead will be formed along the edges of the flanges; hence it is better to give the beam two finishing passes, in order to subject all the edges of the flanges to the action of the shoulders, which will reduce any bead previously formed on the edges of the flanges, the shoulders being made straight and adapted to reduce the flanges slightly beyond the line of finish effected by the shoulders.

As shown in Fig. 3, this invention is readily applicable to a three-high mill, the upper and lower horizontal rolls being the same in size and construction, and the vertical rolls employed between the middle and lower horizontal rolls being reversed as regards position and operation, and hence it is not generally necessary to turn the beam between passes. If desired, the shoulders may be made to project beyond the operative faces of the rims a distance equal to the width of the operative faces of the shoulders during the finishing passes, in which case the shoulders will be omitted, the beveled faces being extended down to the bottoms of the grooves.

THE BASIC BESSEMER PROCESS IN THE UNITED STATES.

Written for the Engineering and Mining Journal, by Prof. Wm. B. Phillips.

It is now ten years since Thomas communicated to the British Iron and Steel Institute the results of his experiments on dephosphorizing pig iron in a Bessemer converter lined with a basic material. The process, popularly known as the basic Bessemer, but more justly described as the Thomas process, has long since passed the experimental stage, and is now as firmly rooted as even the regular acid Bessemer.

It has been shown that the steel made by the Thomas process is well adapted to a variety of purposes, and is, beyond question, a material suited for nearly all the purposes to which steel is applied.

It is not my intention at this time to enter into any discussion of the relative merits of acid Bessemer, basic Bessemer, Siemens-Martin, Clapp-Griffiths, crucible, basic, open-hearth, or any other steels, but to point out as briefly as possible the position now occupied by the Thomas process, and its significance for this country.

Through the courtesy of Mr. James M. Swank, General Manager of the American Iron and Steel Association, I have been furnished with the statistics of the Bessemer steel production of the world for the last few years, *i. e.*, from 1880 to and including 1888.

The following table sets this forth:

TABLE I.

PRODUCTION OF BESSEMER STEEL, BOTH ACID AND BASIC, IN THE PRINCIPAL COUNTRIES OF THE WORLD FROM 1880 to 1888, INCLUSIVE.

YEARS.	Ingots.		Finished steel.			Ingots.		Doubtful.
	United States. Gross tons of 2,240 lbs.	Great Britain. Gross tons of 2,240 lbs.	Germany. Metric tons of 2,204 lbs.	France. Metric tons of 2,204 lbs.	Belgium. Metric tons of 2,204 lbs.	Austria. Metric tons of 2,204 lbs.	Sweden. Metric tons of 2,204 lbs.	Russia. Gross tons of 2,240 lbs.
1880	1,074,262	1,044,382	686,500	384,626	95,000	101,000	30,913	295,568
1881	1,374,247	1,441,719	720,000	418,094	125,000	130,900	39,328	285,082
1882	1,514,687	1,673,649	933,000	451,053	178,000	150,000	47,358	249,000
1883	1,477,345	1,555,380	970,000	440,000	179,429	170,000	50,878	256,000
1884	1,375,531	1,209,676	1,138,499	336,400	185,916	165,000	53,123	248,000
1885	1,519,430	1,304,127	1,140,500	364,058	155,012	226,000	52,021	275,000
1886	2,269,190	1,570,529	1,202,090	348,299	137,771	255,000	71,121	290,000
1887	2,936,033	2,089,403	1,376,356	313,851	191,151	275,900	68,199	100,000
1888	2,511,161	2,012,794	1,400,000?	310,960?	188,000	355,000	70,000?	100,000?

To exhibit the statistical relations borne by the Thomas process to the regular Bessemer, the following table has been constructed from various sources, chiefly, however, from the *Transactions of the Iron and Steel Institute*, and from *Stahl und Eisen*.

TABLE II.

PRODUCTION OF BASIC BESSEMER, OR THOMAS STEEL, FROM 1881 TO AND INCLUDING 1888.

COUNTRIES.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.
England	.....	.....	122,380	179,000	145,707	258,466	364,526	415,131
France	.....	.....	.....	.....	130,582	122,711	174,271	225,890
Belgium and other countries	.....	.....	67,106	.....	51,514	48,595	60,959	46,976
Germany	120,000.	....	} 410,052	.....	617,514	883,859	1,102,496	1,296,487
Luxemburg	.....	....						
Austria	.....	....						
Other countries	80,000.	.....	34,835	.....	.....	.....	.....	.....
Total	200,0005	72,604	634,373	864,000	945,317	1,313,631	1,702,252	1,984,484

Taking now the production of both acid and basic steel as given in the first table, and subtracting the total production of basic steel, we will have the total production of acid Bessemer steel as follows, in tons:

TABLE III.

	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.
Acid+basic	4,533,470	5,259,747	5,117,092	4,802,145	5,036,148	6,127,991	7,349,993	6,926,955
Basic	200,000	572,604	634,373	864,000	945 317	1,313,631	1,702,252	1,984,484
Acid	4,333,470	4,687,143	4,482,719	3,938,145	4,090,831	4,814,361	5,647,741	4,942,471
Per cent. of ratio.	4·44	10·83	12·39	18·00	18·80	21·50	23·15	29·10

While these figures can not lay claim to absolute accuracy they are sufficiently near the truth to allow of some interesting deductions

The increase in the manufacture of basic Bessemer steel or, as I shall hereafter term it, Thomas steel, is one of the most remarkable in the history of the iron trade. Starting with the little 6-pound converter of Thomas in 1878, this process in ten years has yielded in all more than 8,000,000 tons of steel, rising from 200,000 tons in 1881 to 1,984,484 tons in 1888.

Furthermore, it has enabled the steel maker to avail himself of ores which ten years ago were unsuitable for his purposes. It has caused the mining of more than 17,000,000 tons of iron ore which, but for this fortunate discovery, might have remained hidden within the earth. It has caused the distribution of millions of dollars, bearing in their train the necessaries and luxuries of life. The benefits accruing to the agriculturist from this discovery are scarcely less important than to the steel trade. The production of the 1,984,484 tons of Thomas steel last year was accompanied by the yield of 600,000 tons of basic or phosphate slag, of deservedly high repute as a manure. This slag is sold in New York for $12.50 per ton, and whenever it has been judiciously used it has proved itself to be of superior value, per unit of cost, to many acidulated and super phosphates.

All this is very gratifying to those who take pleasure in tracing the various improvements in the arts and sciences by which civilization is advanced and the condition of mankind ameliorated, by which a useless material is changed into a valuable one, and wealth is acquired from substances formerly thrown aside.

And yet we have little or nothing to boast of in this matter. We can applaud the English, German, French, and Austrian iron masters for the perseverence and skill with which they have pursued this method of making steel, but our own mouths are stopped

The total production of Thomas steel in the United States will not exceed, even if it approaches, 50,000 tons, and now it is not made at all. We have had the same opportunities for utilizing this process as our neighbors across the water have had, our engineers are no whit inferior to theirs, our chemists are as able as theirs, our consumption of steel and fertilizers compares favorably with theirs, our ores are as suitable as theirs, and yet we have lagged so far behind them in this matter that we are out of sight. The opinion seems to have grown up here that the only steel for us was acid Bessemer, or Clapp-Griffiths, or open-hearth. One or perhaps two establishments tried the Thomas process, and abandoned it. Why? I am not aware of any specific reason having been assigned, but I have understood that it was because of unsuitable material.

The Thomas process succeeds when suitable ores and limestones are used, just as the acid Bessemer demands its own peculiar conditions. The Thomas process is not the universal panacea for ores too high in phosphorus to be used in the Bessemer process. We may have an ore that contains the proper amount of phosphorus and yet fail in carrying the process to success. A high phosphorus ore is only one of the factors of success, for if the basic lining and the basic additions be not suitable the process ends in failure.

So much foolishness has been spoken and written concerning the Thomas process in this country that people have now become somewhat chary of even listening to the subject. When we are gravely assured by a well known iron master of the existence of an ore in Virginia that contains 32 per cent phosphoric acid (the gentleman persisted in his statement even after some surprise was expressed), it is about time to inquire into one's ability to speak with authority.

It has been said that we had no ores suitable for this process, and no limestones pure enough for linings and additions.

This national reproach has now been removed, allowing, for the sake of the argument, that it ever existed, for ores carrying from 2·30 to 5·3 per cent phosphorus can now be obtained, and limestones of any degree of purity.

I am becoming more and more convinced of one thing, viz., that the natural home of the acid Bessemer process is in the Northern States, and the natural home of the basic process, whether Thomas or open-hearth, is in the Southern States. It is not meant by this that there are no phosphoritic ores in the North or acid Bessemer ores in the South, but that the preponderance of Bessemer ores is in the North, and the preponderance of Thomas or basic ores in the South.

The Southern States, too, offer a ready and growing market for the by product from the Thomas process. It is this part of the country that consumes by far the greater part of the fertilizers used in the United States, and it is to the South that the manufacturers of phosphate slag would have to look for a market.

It is a significant fact that of late years there has been a considerable increase in the amount of raw ground phosphate rock used for manurial purposes in some of the Southern States. This tendency is of importance in the use of phosphate slag, for it must be used in its raw state, not being treated with acids. The most suitable locality for the erection of basic Bessemer works is where the cheapest pig can be made, having due regard to the markets for the steel and for the slag. I suppose there can be no doubt that the Southern States, and more particularly Alabama, offer now the best opportunities for the manufacture of cheap pig. This subject is already threadbare, and I have no intention of removing the few remaining strands. It does not necessarily follow that because a certain locality can and does manufacture cheap pig, therefore it is the best place for steel works. This is begging the question. It is not cheap pig that is wanted for steel works so much as suitable pig. In some respects of the case the cheapest pig would be the dearest pig, for it might be the most unsuitable, entailing constant loss upon the company using it, and finally suspension of the work, as has happened in this country.

As has been already pointed out in this Journal, Vol. xlvii., No. 9, p. 214, the pig most suitable for the manufacture of basic open-hearth steel should have the following composition: Carbon, immaterial; phosphorus, 0 05 to 1·00 per cent; sulphur, upper limit, 0 10 per cent; silicon, 0 05 to 1 00 per cent; manganese, 0·8 to 1·50 per cent.

It was remarked at the time that such a pig was not to be had in the South now. Whether or no it can be furnished in large quantities remains to be tested by the demand for it. While one may believe that it can be furnished, still we will have to wait and see.

The composition of the pig most suitable for the Thomas process may be given as follows: Carbon, 2·5 to 3·0 per cent; phosphorous, 2·0 to 3·0 per per cent: sulphur, upper limit, 0·6 per cent; silicon, upper limit, 1·5 per cent; manganese, 1·0 to 3 0 per cent

Neither is this pig made in the South, nor in any part of the United States. It has been more difficult to obtain suitable ores for the manufacture of this kind of pig than for basic open hearth pig.

And it may also be said that at the present time we have no definite information as to the extent of the deposits of basic ores recently brought to light. Investigations by competent mining engineers and chemists are still in progress, and until their reports are finished it would be foolish to give an opinion. So far the examinations reveal a vein of 18 inches to 30 inches width, extending over two miles of territory and carrying from 2·3 to 5·3 per cent phosphorus, about 38 per cent metallic iron, and from 4 to 6 per cent silica, with a little lime and considerable alumina. It is the most hopeful prospect that has been opened before the Thomas process in the United States, and we shall see what we shall see.

BIRMINGHAM, Ala., July 5, 1889.

THE CAUSES OF THE PRINCIPAL DEFECTS OF WROUGHT IRON.

Written for the Engineering and Mining Journal by A. D. Elbers.

Translating freely from Karmarsch (edition of 1866, Hanover), the following information may be gleaned therefrom, that has a bearing on the subject-matter under consideration: "Iron is called red short when it tears open, bursts or breaks when it is hammered at red heat; but this same iron can be easily forged at a higher temperature, approaching that of its welding heat. The red-shortness is usually caused by sulphur, even when the contents of the latter amount only to one ten-thousandth part of the mass, but it may also be due to copper; copper, however, injures also the welding property, which sulphur does not. Cold short iron is brittle in the cold state, but easily forged at red heat, and it welds remarkably well. Cold-shortness is due to phosphorus when the contents of the latter exceed one two-hundredth part of the mass, but also to zinc, arsenic, antimony, or chrome. * * * Iron has been called 'black short' (blue short) when it lacks tenacity while it is heated to a temperature not quite as high as red heat; such iron is, however, entirely pliable in the cold as well as in the red-glowing state. * * * The cause of this behavior is not yet known."

The foregoing is certainly a drastic statement of the respective conditions, and it leads one directly to the main question, in what form of combination do the vitiating elements obtain; which are those physical properties of the respective elements, or of their compounds, that can be hurtful to the working of the iron at one temperature and beneficial at another; how can one impurity render the metal "red short and weld short," whereas another renders it only red short, and how can iron that is neither coldshort nor redshort become more blue short than that which is either one or the other?

In order to answer such propositions intelligently, it must be premised that every impurity has an influence on the working of the mass at *all* temperatures, either injurious or beneficial, and that the character of this influence changes with the temperature in the measure in which the changes of the latter affect the physical properties of the mass and of its impurities in a different manner.

An impurity that is individually less elastic or less tenacious than iron tends, of course, to render the latter cold short, and if this dissimilarity of behavior continues or increases in heating, also blue short and red short. But if an impurity becomes very soft, or melts at or below blue and red heat, its injurious tendency will then be even much stronger, because the presence of such particles in an otherwise solid mass must have nearly the same destructive effect on the latter when it is subjected to the strokes of a heavy hammer or passed through rolls as so many blowholes or blisters would have. At higher temperatures these easily fusible impurities become less objectionable in the measure in which the iron loses its own rigidity, whereas impurities which are then more rigid than the iron must, of course, greatly lessen its plasticity.

The foregoing remarks will render obvious that the seeming inconsistencies of behavior (that copper, for instance, makes red short and weld short and sulphur only red short) are the best guide for ascertaining the true causes of the principal defects of wrought iron, inasmuch as the impurities to which these defects are attributed can only be held accountable for such doings as are compatible with their known physical properties. This "determination by behavior" is comparatively easy as far as strictly metallic impurities are concerned, because they can be considered as alloys, the properties of which are more similar to those of their respective components than the properties of carburetted, phosphuretted, and sulphuretted compounds are to those of their constituents.

Zinc, for instance, is brittle, expands at low heat much more than iron does, becomes again brittle at about 400 degrees Fahrenheit, and melts below or just about blue heat. It may therefore be supposed to make not only cold short, but also blue short and red short, the latter effect becoming less pronounced in the measure in which the combination of zinc and iron is less fusible and more tenacious than zinc.

Copper is pliable and softer than iron at all temperatures below and also up to several hundred degrees above red heat, but melts before the full welding heat of iron is reached, and re-solidifies more or less suddenly in cooling, probably at about the same temperature at which the welding capacity of the iron gets to be pretty low. Hence its alloys are apt to make red short as well as weld short.

Sulphur renders iron red short and cold short, but the latter effect is scarcely traceable in comparison with that which a fifty times larger quantity of phosphorus must have, for we are told that 0·01 of S. does more harm at red heat than 0·5 of P. at ordinary temperature, from which may be also inferred that the sulphides of iron obtain in the mass in a much more complete state of diffusion than the phosphides do.

The behavior attributed to the phosphuretted impurities appears to be the most remarkable of all, because it seems to keep pace with that of the iron, from the beginning of heating to the end of it, *i. e.*, to the melting point. Iron which is cold short on account of phosphorus becomes already quite pliable and has a fibrous fracture when broken, while it is "hand warm," which term is used to express that the cold iron has been hammered until it becomes so hot that it cannot be held in the hand. This, as well as its subsequent behavior up to welding heat, resembles to a degree very much that of glass, which is also brittle in the cold state, becomes more and more flexible with increasing warmth, highly ductile at red heat, and quite pasty before melting completely. Considering that the presence of phosphorus, say to the extent of one-half per cent, indicates the presence of at least several per cent of its compounds (just as one quarter of one per cent of combined carbon may be supposed to indicate that the wrought iron contains five per cent or more of carbides—Fe_3C, etc.), such a behavior will be found quite natural, provided we know that phosphides, or even phosphates, of iron have a corresponding behavior. In this connection may be mentioned that acid phosphate of lime, or lime treated to excess with phosphoric acid, becomes glass (Sidot's glass) when it is melted at white heat. Though wrought iron contains some slag, which might lead to the supposition that some such phosphates obtain in it the effects of which are now attributed to the presence of silicates of lime, etc., the quantity of such non-ferrous bases seems scarcely large enough to account for a considerable portion of the phosphoric oxide that may possibly come in under the determination: 0, 5 P. Whether the latter assumption is tenable must be left to analysts; it shall for the purpose of this discussion only serve to draw attention to the fact that the physical properties of phosphides and pyro-phosphates of iron must be well known before their great influence on the behavior of iron can be fully guaged; and that should not be difficult to accomplish because the suspected compounds can be produced and examined independently.

The carbides need also be mentioned as impurities. If pig iron consists of carbides and free carbon, wrought iron, and the unmelted steel which is made from it, of metallic iron and carbides, and cast steel of metallic iron and more diffused carbides, the behavior of these compounds can be traced pretty accurately under all conditions. This is especially the case when defects arise, the cause of which cannot be traced to the direct influence of other impurities, and may therefore depend on the smaller or larger contents of carbides.

The bad results of blue heatworking and of overheating seem to be in many cases due to the following causes:

The elasticity of iron is the concomitant of its structural cohesion or tenacity; but these properties are known to diverge at very low temperatures, and probably do so again in a marked manner at blue heat, the elasticity decreasing most rapidly at that point, whereas the hardness of the iron decreases more rapidly after red heat has been reached. Blue heat may, therefore, be considered to be the critical temperature at which iron does not expand in strict proportion to the increase of temperature (zinc is still more obstinate at about 400 degrees Fahrenheit), hence it is liable to become strained, and consequently injured by hammering, etc., at that temperature, which injurious effects are, of course, removed when the metal is thereafter heated to redness or to that point where its particles have sufficient freedom of motion to re-adjust their cramped position. Numerous reheatings to a temperature in which the metal expands freely have, however, the effect that many particles are forced into relative positions differing from those which they held originally, because the conditions that produce expansion and contraction vary more or less in every fire, in every furnace, with the position of the heated piece and with its shape; the effects of overheating, or of the too frequent heating of the metal above its critical temperature, need, therefore, scarcely any other explanation. But there is also a chemical effect to be considered. The affinity or attraction which the iron particles and impurities of the metal have for each other as "chemically unlike" substances, when they are in close contact, weakens in the measure in which the mass expands. With each reheating to that temperature in which the mass expands freely, some of the chemically unlike particles become separated, and, for reasons already mentioned, will have no chance to resume their former adhesion after the mass has contracted. Hence, each reheating lessens the bonds that hold the mass most tenaciously together; and that iron which contains the smallest quantity of such bonds or impurities is therefore apt to lose its tenacity quicker, or is less able to endure numerous heats than that which contains a larger quantity of them.

Overburning takes place at a higher temperature than that which is required for welding; it is, therefore, probably due to the circumstance that those impurities which had no time or chance to satisfy their combining propensity during the first melting or puddling of the mass combine then with more of metallic iron or change in other ways to the detriment of the latter. This result depends, however, less on the quantity of the impurities that on their character.

Having designated the carbides of iron as impurities, the alloys of iron and manganese—which, in nine cases out of ten, are the most desirable admixture that wrought-iron can have—must be included in the same category in order to render the following deductions and conclusions more fitting: Wrought-iron consists of aggregates of threads; these threads consist of minute crystals, of pure metallic iron, which are interspersed with minute particles of free oxides, carbides, phosphides, sulphides and alloys of iron, with silicates and, possibly, with other kinds of slag. The total quantity of these compounds, or even that of a single kind (carbides), amounts frequently to more than five per cent of the bulk of the iron, and must therefore have a decided influence on its behavior as well as on the appearance of its fractured surfaces. The iron crystals are held together by physical attraction or *cohesion*, and by the chemical attraction or *adhesion* of the interspersed compounds. As all of these compounds are, at some temperature, *less* tenacious than the iron crystals, and as most of them are less tenacious under all conditions, it may be supposed that the fractured surface of a piece of wrought-iron gives, in most cases, less the picture of the iron crystals than that of the interspersed compounds. Thus the coarse crystals that are seen in cold-fractured coldshort iron may be supposed to be aggregates of iron crystals that are enveloped in phosphuretted compounds, and the fine crystals that are seen in high quality fine grained iron, to be aggregates of iron crystals that are enveloped in carbides and in ferro-manganese. Both kinds of iron break "fibrous" when they are fractured while they are "hand-warm," and in both cases the fibrous condition is due to a lateral bend of the threads, but in the one case the threads are "topped off," or end with dull-looking points, and in the other the points, as well as the lateral appearance of the threads, are much brighter or "silky."

Similar distinctions can be made in regard to most of the other compounds if the conditions to which the material has been subjected are fully known, for the appearance of the iron crystals themselves or "per se," is not likely to be ever changed by long continued concussion, vibration or similar physical influences.

None of the remarks herein made are intended to appear authoritative; they emanate merely from the recapitulation of reminiscences dating back more than ten years, and to a time when I was in intimate technical intercourse with iron makers of recognized ability. But I suppose that I will have to be responsible for the way in which I have put known and unknown things together, which is, perhaps, to many readers the most interesting feature of this discussion.

HOBOKEN, July 1st, 1889.

AMERICAN ENGINEERS IN PARIS.

On the arrival of the engineering party in Paris on Thursday evening, June 20th, the most welcome news that greeted us was that Friday was to be devoted to the much needed rest after the London hospitalities. On our arrival at Calais, the party was met and welcomed by a large detachment of members of the Société des Ingénieurs Civils, and much regret was felt by many of the visitors that time did not admit of the first part of the programme, viz., the inspection of the magnificent new harbor works at Calais, now in process of completion, being carried out.

On the journey to Paris the special train stopped near St. Omer, to enable the party to inspect the gigantic hydraulic canal lift, which was illustrated and described in the ENGINEERING AND MINING JOURNAL of September 29th, 1888.

On Saturday the official reception by the Société des Ingénieurs Civils took place in the Exposition Building, under the presidency of Mr. Eiffel, of tower fame.

The Eiffel tower was, after the reception, the first point of interest visited, and it is hardly worth while to say more about an object now so well known and which was also described and illustrated in your journal of February 2d of this year. On the first platform of the tower we were entertained by our French hosts at luncheon, and sundry speeches followed in French by Mr. Eiffel, Mr. Henry R. Towne and others.

We then broke up into parties to visit various sections of the exhibition, each attaching himself to the one that most appealed to his tastes, mechanical, mining, metallurgical, and so forth. Sunday could be called only more or less a day of rest, as there was a good deal of sightseeing carried out, many enjoying the drive to Versailles and St. Cloud.

On Monday the celebrated sewers of Paris were visited by many, the Gobelin Tapestry Works and the Observatory by others, Pasteur's Hospital, and the Ecole des Mines, under the courteous guidance of M. Haton de la Goupillière, who for many years has been one of the professors. One of the most interesting visits of the day was to the Compressed Air Company's Works (Popp's system) already described in the ENGINEERING AND MINING JOURNAL, May 18th, 1889. W.

MINERAL WEALTH OF SOUTH CHINA.

Kuang-tung is a province of South China, with an area of 104,190 English square miles, and a population of about 19,200,000. It is divided into five circuits, nine prefectures, two departments, nine sub-prefectures of the ting class, four districts, seven sub-prefectures of the chou class, and seventy-eight counties. In this enumeration, the island of Hai-nan is included. It has four seaports open to foreign trade, Kuang-Chou Fu, or Canton City, which is the provincial capital, in lat. 23° 08′ N., long. 111° 17′ E.; Swatow or Shan-tou, lat. 23° 20′ N., long. 116° 39′ E.; Pak-hoi or Pei-hai, lat. 21° 30′ N., long. 109° 13′ E.; Hoi-how or Hai-kou, lat. 19° 56′ N., long. 110° 15′ E. The natives of Kuang-tung Province are a turbulent but industrious race, fond of emigration to foreign countries, whence most of them return to their native land to spend their last days on the wealth amassed abroad and surrounded by their relations and friends.

Kuang-Chou Fu (Canton) is the chief prefecture in Kuang-tung province. It is rich in various kinds of produce, and its mineral products are gold, silver, copper, lead, tin, iron, coal, crystal, pearls, coral, and salt.

Shao-Chou Fu yields silver, copper, zinc, iron, and coal in various parts of the prefecture, but it is doubtful whether these minerals are worked or mined in anything but a very primitive and limited way.

Ch'ao-Chou Fu, the chief city in this perfecture, yields silver, tin and salt, although it is likely that the tin is imported from the Straits Settlements or Malacca.

Chao-Ch'ing Fu—On the banks of the West river; gold, silver, copper, tin, lead, iron and coal are produced, but all on a very limited scale.

Hui-Chou Fu—Silver, tin and salt are enumerated amongst its numerous productions. Salt is plentiful.

Chia-Ying, Chih-li-Chou, etc., yields copper, tin, iron and coal, and as many of the natives emigrate to foreign countries, where they are employed in mining operations, it is quite possible that those who return from abroad take an interest in the mining operations of their native district.

Kao-Chou Fu—Silver, pearls and salt are found in this prefecture, and there is some excellent iron ore in some of the hills near the sea.

Lien-Chou Fu—Gold, silver, iron, pearls and coral are produced in this prefecture.

Ch'iung-Chou Fu; this name applies to the whole of Hainan, as it ranks as a prefecture of Kuang-tung Province. Gold, silver, iron, coal, pearls, salt and coral are produced here.

Kuei-lin Hu is the chief prefecture in Kuang-si Province. The geological formation in this part of Kuang-Si is very strange, and different from that in any other part of the continent. For a day before reaching Kuei-lin city by the River Kuei or Fu, the traveler is astonished by the sight of innumerable peaks of limestone all detached from each other and covered with what appears to be evergreen shrubwood. Even within the city walls of Kuei-lin there are one or two of these curious peaks. On approaching the city some of these peaks are seen to be connected to one another at their bases; some have fine caves running into their sides, and some are perforated from side to side, so that daylight is seen through them, and a road goes through one. Silver, copper, lead, cinnabar, jade, and coal are found here.

Lin-Chou Fu—Gold, silver, iron, saltpeter and sulphur are produced here. No doubt lead is also found, as some of the old T'ai-ping chiefs state that it furnished every requisite for the war, including ponies for transport and cotton cloth for tents, food for the men and fodder for the animals, iron for making weapons and ammunition for them; silver to pay the troops with and copper to make their cooking pans. Small steamers might navigate the river as far as Yung-Hsien, if there are no obstructions in the river near its junction with the West river. Large salt junks reach here.

Ch'ing-Yuan Fu—Silver, tin and cinnabar are found in this prefecture, and it is quite possible that coal and iron exist as in many other parts of Kuang-Si. Firewood is abundant and cheap, so there is no demand for coal, whilst manufactured iron ware is easily imported from Kuei-Chou Province.

Ssu-ên Fu—Gold, zinc, and iron are said to be found here, but I have not heard of their being worked.

Ssu-Ch'êng Fu—Cinnabar is the only mineral reported in this prefecture.

P'ing-lê Fu—Gold, silver, copper, iron, lead, and tin are produced here, and white lead or zinc white is manufactured and exported.

Wu-Chou Fu—This city is an important centre of trade for Kuang-Si and some parts of the adjoining provinces. Coal and saltpetre are the only minerals reported here, but silver and lead are probably present in some of the neighboring hills.

The place is frequently visited by steamers from Canton, and were it not for the excessive dues levied on trade, and the trouble given to merchants at the many custom house stations in this prefecture, and the whole of Kuang-Si province generally, trade would no doubt expand manifold, and the brigandage and piracy so prevalent in the province would cease. All the principal waterways or courses in Kuang-Si are tributaries of the Hsi-Yang Chiang, or West river; and the whole trade of Kuang-Si is throttled by the custom house at Wu-Chou.

Hsün Chou Fu—The prefecture is rich in minerals—gold, silver, lead, zinc, iron and arsenic abound in various places, especially in the range of hills at the back of Kuei-Hsien city, and as it is only four days' journey from the treaty port of Pak-hoi, machinery might easily be transported wherever required, especially to silver mines at the back of Kuei-Hsien.—*Indian Engineering.*

Composition of Megabasite from Bonita Mountain, near Silverton, Col.*—More than three years ago Harry F. Keller received from Colorado, among other specimens, one which was labelled "gothite." Some qualitative tests proved that it consists essentially of tungstic acid and manganous oxide. The occurrence has become quite well known since, but, as far as the author is aware, no quantitative analysis of the material has been published, therefore he places the following on record: Sp. Gr. = 6·780, WO_3 = 74·24, MnO = 21·09, FeO = 2·06, CuO = ·11, MgO = trace, SiO_2 = 2·13; total, 99·63.

Minerals in British Columbia.—The mayor of Vancouver (Mr. Doppenheimer) has issued a pamphlet, in which it is stated that British Columbia will probably, one day, rank among the richest mineral districts of the world, there being found gold, silver, copper, iron, coal, lead, cinnabar, platinum, antimony, bismuth, limestone and plumbago. Some of these minerals, such as coal, have been profitably mined for years, while others are waiting for further development. Iron ore exists in large quantities in various parts; but the deposits most favorable for working are situated at Texada Isiand, in the Gulf of Georgia, about 60 miles by water from Vancouver, where there is a perfect mountain of ore, which is alleged to assay 68.4 per cent of iron. Copper is found in a number of places, and coal is widely distributed.

The Russian Petroleum Trade.—The works in connection with this undertaking have been in hand for several months past, and have involved the laying down of 34 miles of 4-inch oil piping. The pipe line starts from the Suram Station of the Transcaucasian Railway, and traversing the ridge of the Lesser Caucasus at a height of 5,200 feet above the sea level, terminates at Quirill Station, on the Black Sea side of the mountains. The pipe can hold at one time over 100,000 gallons of kerosine, which, reckoning 300 days to the year, implies an annual capacity of 60,000,000 gallons. Thanks to the pipe line, which has been constructed by the Nobel firm, the export of kerosene from Batoum will be considerably increased, and the Nobels have already chartered three tank steamers to convey the oil thence to Europe.

Bent Pipes.—Experiments recently made on the strength of bent pipes have shown the strain on the inside of the angles due to efforts of the pipes to straighten themselves under pressure. The problem is one of considerable intricacy, resolvable, however, by computation, and is a good one for practice by engineering students. In one of the experiments referred to a copper pipe of 6¼ inch bore, $\frac{5}{16}$ inch thick, was used. The angle was 90 degrees and the legs about 16 inches long from the center. At a pressure of 912 pounds to an inch the deflection of the pipe was nearly ⅜ inch, showing an enormous strain on the inner side in addition to the pressure. A steam engine indicator is made in England on this principle, in which a curved pipe is employed, and the tendency to straighten under pressure produces the recording movement. —*Industry.*

Japan as a Coal Producer.—There is every probability that Japan will shortly become entirely independent of other countries as regards its coal supply, since vast coal fields have been recently discovered in the islands of Kinsiu and Yesso. The Karatin coal is found in beds 5 feet in thickness, and over an area of about 120 square miles. Anthracite is met with in the island of Amakusa, near Kinsiu, and there are also important collieries in the immediate neighborhood of Tokio, while abundance of lignite can be obtained in all the Japanese provinces. The Japanese coal output amounted in 1881 to about 700,000 tons, and it has been steadily increasing since that period. The mines are worked on the most approved European principles, and most of the machinery employed has been supplied by Germany, only a small quantity having been imported from Great Britain.

Dust Particles in the Air.—An ingenious method has been devised by Mr. John Aitken for counting the dust particles in the atmosphere. It was found that when the moisture is condensed in a rarefied atmosphere, each raindrop has a dust particle for its nucleus, so that by sweeping a measured portion of the air into an exhausted receiver, by means of pure air, and counting the number of deposited drops, it is easy to calculate the number of dust particles in a given volume of the impure air. The counting is managed by having the silver plate in the receiver divided into millimeter squares, so that it is only necessary to count the drops on one square millimeter. Mr. Aitken showed that the air of a hall contained 400,000 particles to the cubic centimeter, while a specimen of air

* Read at the meeting of the Chemical Section of the Franklin Institute, May 21st 1889.

taken near the roof of the hall gave 3,500,000 to the cubic centimeter. In Edinburgh, on a fine day after snow, the number of dust particles in the cubic centimeter was 75,000, but in pure country air the number is often as low as 5,000.

Liquefaction of Gases by Electricity.—The following method of liquefying gases has recently been discovered: Strong hydrochloric acid is introduced into a combustion tube, bent at right angles, so as to cover two small platinum plates fused into the closed end of the tube; a plug of asbestus, saturated with concentrated sulphuric acid, is placed at the bend; the open and shorter arm is then fused up and immersed in a freezing mixture. On the passage of a current through the plates, gas is evolved and liquefies at the other end; but on removing the tube from the freezing mixture and discontinuing the current the liquefied hydrogen chloride is reabsorbed by the water. The experiment may then be repeated. Other compound gases behave in a similar manner. When acidified water is decomposed in this apparatus, and a platinum plate covered with platinum-black has been fused in the short end, explosions occur there at intervals, and small quantities of water form, containing hydrogen peroxide, and having an ozonized odor. With chromic acid and water the blue oxide of chromium is obtained.

New Pullman and "Colonist" Cars.—The Northern Pacific has new sleeping cars—Pullman and "colonist" sleepers. The latter are the finest of the kind run upon any of the transcontinental roads. The advantage over the old car is that each berth is made as private as those in a Pullman. Separating one from the other is a solid sliding headboard. Heretofore these divisions were made with screens, and, as a consequence, gave but little privacy. Each section is fitted up with curtains, bedding, and a table. If a person does not supply his own bedding, he may purchase a complete outfit for $3. This includes curtains, blankets, mattress, pillows, sheets and pillow-cases. When the journey is terminated these become the personal property of the purchaser to dispose of as he may see fit. One end of the car is fitted up as a kitchen, with a large range and ample water supply. In the other end is a fireproof Baker heater. The new Pullmans are even a greater novelty. Each car has two staterooms—one single and the other a double room. The remainder of the car is altogether different from the ordinary sleeper.

Railway Enterprise in Japan.—Large railway orders for Japan are given in England at present. One on its way includes 10 engines, about 100 carriages and many thousand casks of cement, while a cargo of steel rails is on its way out, and many other orders are in various stages of completion. For three years past, although the Japanese have been constructing railways with extraordinary activity, scarcely a single order for railway material was placed in England, though prior to that they all were sent there. They stopped suddenly for two or three years, and are now beginning quite as suddenly again. The secret of the matter is that all the Japanese railways are either government lines or constructed under government guarantees; in one way or another the government exercises a powerful influence over them. Three years ago, when the Treaty Conference in Tokio were about to sit, and while they were sitting, Japanese statesmen were straining every nerve to conciliate the ministers of the leading powers, and it was soon found that large orders were the most effective instruments for that purpose. Accordingly, Japanese naval orders went largely to France, and those for railway material went to Germany, chiefly to Krupp's, at Essen.

Antique Marble.—Marble is divided into antique and modern. Antique marble is that which came from quarries which are now either exhausted or unknown. Modern marbles are those which are still being quarried. The antique marble quarries which were in Greece, and from which were made the most beautiful statues still existing in Italy, are unknown now. We use in its place Carrara marble. The finest of these antique marbles is the lapis. It is of a deep blue color, stained with a clearer sky blue and intermixed with veins of golden hue. This marble, because of its rarity, was only used for inlaying. There are several specimens of it still to be seen in mosaic. "Porphyry" ranks next to the lapis in value, and is the hardest of the antique marbles. It was brought from quarries in Numidia in Africa, and was called the Numidian lapis. It varied in color, being either red, gray or green. The red variety is susceptible of the highest polish, and is of a deep red color with white spots in it. The green porphyry was very rare, and is only known through a very few vases and slabs. Serpentine was formerly obtained from the Egyptian quarries. The stone used by the ancients in the largest quantities was granite. Most of the buildings of Rome, even to the dwellings of private citizens, were decorated with it, and it is evident that this stone was abundant from the amount that was used. We find it in many colors and qualities, and applied to every use to which stone can be put.—*Stone.*

Prof. N. S Shaler on the Natural Gas Supply.—Professor Shaler says: The districts known to contain natural gas in sufficient quantities to have any economic value within the United States, probably exceed 50,000 square miles, and it is likely that further inquiry will develop numerous fields as yet unknown. A great many wells bored for petroleum in the wild search for that earth product, which went on twenty or thirty years ago, developed large quantities of natural gas. The value of the substance was at that time not appreciated.

These wells gradually became closed by various accidents, or wasted their contents in the atmosphere. The value of natural gas in the economics of this country is now but little, if any, below that of petroleum, and the probability is that within a few years it may exceed that substance in value. It is a matter of great interest to determine not only the areas occupied by this valuable resource, but the circumstances of its formation. There can be little doubt that it represents the decomposition of organic matter, the fossil of old rocks, and that it is usually generated at the same time as petroleum, being only a lighter form of the same varied series of hydrocarbons. The facts appear to indicate that under certain circumstances gas may be produced in large quantities with little or no oil, while at other times the oil may abound and the gas be small in quantity.

The preservation of these gases, as well as the associated petroleum products in the Mississippi Valley, is due to the fact that the rocks of this region have been but little affected by mountain disturbances. If the strata now contain these hydrocarbons had been folded and riven, as is the case in mountain-built countries, the gas would have escaped and driven before it to the surface the oil as well, and so these resources would have disappeared from the under earth and become decomposed in the atmosphere.—*Light, Heat and Power.*

BOOKS RECEIVED.

[In sending books for notice, will publishers, for their own sake and for that of book buyers, give the retail price? These notices do not supersede review in another page of the Journal.]

Electrical Rules, Tables, Tests and Formulæ. By Andrew Jamieson, C. E. Published by the Industrial Publication Company, New York, 1889. Pages 64. Illustrated. Price 75 cents.

A History of the Comstock Mines, Mineral aad Agricultural Resources of Silver Land. By Dan De Quille. Published by F. Boegle, Virginia, Nev., 1889. Pages 158.

Petroleum in Wyoming Territory, and Special Report on the Stockade Oil District and the Property of the Lakota Oil and Coal Mining Company in Crook County, Wyoming, by Prof. G. E. Bailey, E. M., Ph.D. Rapid City, Dak. 8vo, 20 pp.

The Past, Present and Future of Scientific Agriculture, an address delivered before the New Jersey Board of Agriculture, by Peter T. Austen, Ph.D., V. C. S. Trenton, N. J. 8vo, 16 pp.

The Relation of Fertilizers to Fruits. An address delivered before the New Jersey State Horticultural Society, by Peter T. Austen, Ph.D., V. C. S. New Brunswick, N. J. 8 pp. Also, several other reprints of Dr. Austen's papers.

The Prospectors' Hand-book. A guide for the prospector and traveler in search of metal-bearing or other valuable minerals. By J. W. Anderson, M. A. Published by Messrs. Crosby, Lockwood & Son, London, 1889. Fourth edition, thoroughly reversed and enlarged. Pages 145, and index illustrated.

Bulletin of the New York State Museum of Natural History, No. 7, June, 1889. First Report on the Iron Mines and Iron Ore Districts in the State of New York. By John C. Smock, Department of Mineralogy and Economic Geology. Published by the New York State Museum, Albany, N. Y. 1889. Pp. 70 and Index. Illustrated.

PATENTS GRANTED BY THE UNITED STATES PATENT-OFFICE.

The following is a list of the patents relating to mining, metallurgy, and kindred subjects, issued by the United States Patent-Office.

PATENTS GRANTED JULY 9TH, 1889.

406,430. Process of Recarbonizing Steel. John H. Darby, Brymbo, County of Denbigh, assignor to Percy Carlyle Gilchrist, London, England.
406,434. Limekiln. Joseph Druecker, Wis., and John Druecker, Chicago, Ill.
406,440. Mechanical Motor. Edgar S. Harpst, Tyler, Tex.
406,443. Cut-Off Valve. Michael J. Heaphy, Brooklyn, N. Y.
406,457. Means for Sinking Tube Wells. Frederick M. Miller, Brooklyn, N. Y.
406,477. Frictional Gearing. Almon Robinson, Lewiston, Me.
406,479. Process of Forming Screw Caps. George Schrader, New York, and Joseph Schmitt, Brooklyn, N. Y.
406,482. Blast or Exhaust Apparatus. John Y. Smith, Doylestown, Pa., Assignor to the Smith Exhaust Pipe Co., of New Jersey.
406,483. Triple Expansion Blast or Exhaust Apparatus for Locomotives. John Y. Smith, Doylestown, Pa., Assignor to the Smith Exhaust Pipe Co., of New Jersey.
406,484. Exhaust Apparatus for Locomotives. John Y. Smith, Doylestown, Pa., Assignor to the Smith Exhaust Pipe Co., of New Jersey.
406,492. Armature Winding for Dynamos. James J. Wood, Brooklyn, N. Y.
406,493. Self-Regulating Dynamo. James J. Wood, Brooklyn, N. Y.
406,501. Apparatus for Upsetting Eye Bars. Watts Cooke and Daniel Carlough, Paterson, N. J.
406,503. Apparatus for Vaporizing Oil. Herbert Cottrell, Newark, N. J.
40.,522. Grinding Mill. Frank C. Hall, Philadelphia, Pa., Assignor to William C. Stevenson, same place.
406,540. Hydrocarbon Engine. Mathias V. Schultz, Cologne, Prussia, Germany.
406,557. Balanced Slide Valve. Joshua B. Barnes, Springfield, Ill.
406,565. Expansion Bolt. Isaac Church, Toledo, O.
406,566. Preserving Railway Ties. Plimmon H. Dudley, New York, N. Y.
406,579. Hoist. Joseph J. Green, Canton, Ohio.
406,586. Apparatus for Reversing Rotary Motion. George Layng, Worcester, Mass., Assignor of one half to Silas W. Goddard, same place.
406,597. Apparatus for the Manufacture of Pyroxyline. Robert C. Schupphaus, Adams, Mass., and Merritt T. White, Newark, N. J.
406,600. Electric Railway Motor. Frank J. Sprague, New York, N. Y., Assignor to the Sprague Electric Railway and Motor Company, same place.
406,606. Valve for Steam Pumps. Ambrose A. Tripold and Charles H. Tripold, Brooklyn, N. Y.
406,615. Hydraulic Governor for Steam Pumps. Chas. H. Atkin, Palmer, Assignor to the Geo. F. Blake Manufacturing Company, Boston, Mass.
406,630. Safety Attachment for Elevators. James Cowie, Leisenring, Pa.
406,635. Concentrating and Amalgamating Machine. George O. Dickinson, Stockton, Utah.
406,659. Apparatus for Burning Culm or Pulverized Coal. Allan Mason, Brooklyn, Assignor to Herbert H. Sanderson, trustee. New York, N. Y.
406,676. Water Motor. Hugo A. Strong, New York, N. Y.
406,678. Recording Apparatus for Electric Meters. George W. Walker. New York N. Y.
406,679. Windmill Tower. George Wallenbeck, Ithaca, N. Y.
406,701. Rolling Mill. Robert A. Carter, Pittsburg, Pa.
406,706. Compound Gas or Oil Motor Engine. William J. Crossley, Openshaw, Manchester, County of Lancaster, Eng., Assignor to the Gas-Motoren-Fabrik-Deutz, Deutz-on-the-Rhine, Germany.
406,732. Retort and Muffle Furnace. Julius T. Hasse and Hermann M Vacherot, Dresden, Saxony, Assignors to the Stettiner Chamottefabrik Actien-Gesellschaft, Stettin, Prussia, Germany.
406,743. Electric Railway. Walter H. Knight, New York, N. Y.
406,747. Manufacture of Metal Wheels. James R. Little, Quincy, Ill., Assignor by mesne assignments to the Quincy Metal Wheel Company, same place.
406,751. Electrical Apparatus for Regulating Steam Boilers, etc. Francois Martenot, Paris, France.
406,753. Apparatus for Burning Culm. Allan Mason, Brooklyn, Assignor to Herbert H. Sanderson, trustee, New York, N. Y.
406,771. Secondary Battery Electrode. Andrew L. Riker, New York, N. Y.
406,782. Fastening for Mining Drill Stocks. Edward Smith, Plymouth, Pa.
406,797. Closed Slotted Conduit for Electric Railways. Charles J. Van Depoele Lynn, Mass.
406,801. Railway Gauge and Tie Grip. Alfred F. Washburn and Ernst E. Krengel, Independence, Oreg.
406,803. Carrier for Electric Railway Systems. David G. Weems, Baltimore, Md., Assignor to the Electric Automatic Transit Company, same place.
406,804. Electric Railway. David G. Weems, Baltimore, Md., Assignor to the Electro-Automatic Transit Company, same place.
406,833. Means for Propelling Vehicles by Secondary Batteries. William W. Grissom, Haverford College, Pa.
406,838. Shaft Coupling. John H. Hebblethwaite, Rock Falls, Ill., Assignor of one-half to Joseph Wright, same place.
406,844. Brake for Locomotives. Frank Lansberg, St. Louis, Mo., Assignor to the Lansberg Brake Co., East St. Louis, Ill.
406,847. Automatic Cut-Off. Joseph Miller, Greenfield, Ind., Assignor to Joseph Miller and Henry Snow, same place.
406,853. Car Wheel. James Rigby, Minneapolis, Assignor to the Rigby Car Wheel Co., St. Paul, Minn.

PERSONALS.

Mr. Herbert A. Pearson, largely interested in mining in Idaho, was drowned while bathing at Chicago, Ill., on the 8th inst.

Mr. Thomas H. Cavenaugh, of Olympia, W. T., has been appointed Surveyor-General of Washington Territory, vice J. Cabell Breckinridge, removed.

Colonel F. K. Hain, general manager of the Manhattan Elevated Railroad Company, New York, has accepted the presidency of the Julien Electric Traction Company.

Mr. James A. Chambers, the glass manufacturer, sent in his resignation yesterday from the Wage Committee of the Western Window Glass Work s Beneficial Association.

Mr G. W. Chadwick, whose extensive mining operations in Dakota will be remembered by many readers of the ENGINEERING AND MINING JOURNAL, has returned to New York.

It is announced that President Thurston, of the Bethlehem Iron Company, is about to remove his residence to Cuba. Vice-President Robert P. Linderman will act as President.

Superintendent Porter, of the Census Office, has appointed Henry Pemberton, Jr., of Philadelphia, Pa., a special agent, to assist Special Agent Bower in the collection of the statistics relating to the chemical industry.

Mr. Clarke Merchant, of Merchant & Co., of Philadelphia, Pa., has just returned from an extended visit abroad, during which time he made it convenient to personally look after the details of manufacture of their guaranteed roofing plates.

Mr. William G. Watson, ex-Mayor of Paterson, N. J., and the founder of the Wat-on Manufacturing Company, died on the 7th inst. at Morrow's Mills, aged seventy years. He was the builder of the iron bridge at Rosendale, and many similar structures.

The following appointments of consuls have been made: Emmons Clark, of New York, at Havre; Archibald J. Sampson, of Colorado, at Acapulco; Roswell G. Horr, of Michigan, at Valparaiso; James F. Hartigan, of the District of Columbia, for the port of Trieste and all other ports in the Austrian dominions, etc.

The Hon. Gerald McGarel Hogg, who spent last summer in Montreal studying the phosphate interests of Canada, has been admitted as a partner in the firm of Messrs. Couper, Millar & Co., London, England, the well-known phosphate importers, whose Montreal house Messrs. Millar & Co. are the agents for—the Canadian Phosphate Company, Limited.

Mr. H. D. Pearsall, the inventor of the ingenious Pearsall hydraulic engine, described in the ENGINEERING AND MINING JOURNAL, October 20th, 1888, is at present in this country, erecting at the Potts' Furnace, Barneston, Pa., one of his engines, built in England. Mr. Pearsall desires to make arrangements with some well-established manufacturer to make and market his engine.

Mr. W. H. Paine, consulting engineer of the Brooklyn Bridge, has resigned. At the same time he calls attention to the fact that he is the inventor of the grip now in use on the cars and requests such settlement as might be right and proper. President Howell stated that the matter would at once be referred to a committee and proper compensation awarded.

The Aspen, Colo., *Times*, commenting on remarks on mining boundary lines made during the late Colorado meeting of the American Institute of Mining Engineers, says: "Dr. R. W. Raymond is a man after our own heart on the side line question. His views are in accord with common sense; they are in harmony with justice, and the people of Aspen heartily thank him for so boldly and clearly enunciating them."

The United States Association of Charcoal Iron Workers is invited to hold its tenth annual meeting early in September, probably the 10th, in Wisconsin, using Milwaukee as a point of assembly, and going as far as Ashland, Wis., and possibly also to Duluth, Minn. Arrangement of details are now being perfected. It is possible that the trip will embrace the Gogebic and Vermilion iron ore districts. Full information will be given in a subsequent notice.

The Supreme Council of the American Order of Steam Engineers, which has been in session in Boston, Mass., this week, has elected the following officers: J. Young, Jr., of New York, supreme chief engineer; Jeremiah Leahy, Jr., of New Jersey, first assistant chief; Charles E. Jacks, of Massachusetts, supreme recording engineer; W. V. Warfield, of Massachusetts, supreme corresponding engineer; William E. Jones, J. H. Blanchard and J. W. Diehl, executive officers. The next council will be at Philadelphia next July.

A polytechnic school is about to be established in Pittsburg, Pa., under the auspices of the Western University. The building now in course of erection on Observatory Hill will be called Science Hall. In the basement will be a forge-room, testing-room, wood-working room, foundry, modeling room, pattern room, metal-working room and a supply storage room. On the first floor will be the various laboratories, apparatus room, lecture room and an office. On the second floor will be rooms for collections and other purposes.

In accordance with the recently adopted act providing for the examination of miners in the anthracite region, Pennsylvania, and to prevent the employment of incompetent persons as miners, the following miners have been appointed as a Board of Examiners in the first inspection district: David McMine and Henry Collins, of Carbondale; Thomas Jay, of Jermyn; Michael Gilroy, of Archbald; John G. Humphreys, of Olyphant; William S. Griffiths, of Taylorville; George Frey, Miles Gibbons and William E. Morris, of Scranton.

The position of expert and special agent for the collection of statistics relating to railroads, canals, telegraphs, telephones and steam navigation has been offered to Prof. H. C. Adams, of Ann Arbor University. Mr. Adams has the offer under consideration. He is at present the statistician of the Inter-state Commerce Commission. Mr. John S. Lord, Chief of the Bureau of Labor Statistics, has been offered the position of special agent for the collection of statistics relating to the recorded indebtedness of the people for the State of Illinois.

The appeal in the suit of Haggin vs. the Comptoir d'Escompte, in London, to recover £31,610 on a guarantee for the Société des Métaux, which the Comptoir d'Escompte defended on the ground of not being domiciled in England, has been decided in Mr. Haggin's favor. The appeal was dismissed without calling on counsel for the respondents, holding that the defendant company carried on business in England, and that the writ was properly served on the secretary or manager at the branch in Threadneedle street.

Much excitement exists at the Oxford Furnace, Oxford, N. J., over the stealing of valuable private papers belonging to William H. Scranton, who died on June 1st. Col. Scranton was founder of the iron works at Oxford, and had valuable treatises on the construction of blast furnaces, magnetic surveys, mine workings, etc., giving drafts, plans, and full details. Some one, as soon as Col. Scranton was dead, entered his office, broke open his desk, and stole the papers and note books. The family has offered a large reward for the recovery of the papers, which contain, it is said, secrets worth thousands of dollars to iron and steel manufacturers.

INDUSTRIAL NOTES.

The Norfolk & Western Railroad has purchased a farm opposite Ceredo, W. Va., in Lawrence County, Ohio. Recent purchasers on both sides of the Ohio River indicate their intention to bridge at that point.

Furnace B of the Low Moor Iron Company of Virginia has gone out of blast after a continuous blast of 23 months, and total output of 85,000 tons. Furnace A will be put in blast about the middle of the month.

The Moundsville, W. Va., rolling mill is to be torn down and removed to Iron Gate, Va. This mill has been delayed in removal owing to the numerous rains, it being impossible to make the necessary brick for the new building at Iron Gate.

The Abendroth & Root Manufacturing Company of New York, manufacturers of spiral riveted pipe, have established a branch office at 62 South Canal street, Chicago, in charge of Smith & Knapp, for the sale of its pipe, couplings, joints, etc. They will carry a stock to supply the small trade in Chicago and tributary territory.

The Bellefonte Furnace, Boyd County, Ky., of the Means & Russell Iron Company has again been put in blast after the addition of a new hot blast stove. They will continue the manufacture of warm blast charcoal pig iron, with a daily output of 15 tons. This is, perhaps, the only furnace in the south that has a colored founder.

The Hazelton Boiler Company, New York, have just booked an order from the Phœnix Iron Company, Phœnixville, Pa., for two of their 250 H. P. boilers. This makes the sixth consecutive order that they have received from the same firm, and when these two new boilers are in position they will make a total of 1,475 H. P. of the Hazelton boilers in operation at the Phœnix works.

The Redemann-Tilford Steel Company, of Louisville, Ky., which owns the Redemann-Tilford process, which consists in the conversion of Bessemer or other low-grade steel into high-grade steel, avoiding the expensiveness of the processes in general use for the manufacture of steels of the best quality, is offering for sale a limited amount of the stock for the purpose of erecting a plant to put its process in operation.

The Lidgerwood Manufacturing Company, of New York, has found it necessary, owing to the constantly-increasing demand for its hoisting machinery, to establish a branch house at Chicago, where they can deal directly with its large Western trade, and an establishment has just been opened at 34 and 36 West Monroe street, that city, where they will carry a large stock of the latest improved machines adapted for all hoisting purposes.

The Paige Tube Company, of Warren, Ohio, has been organized under the laws of Ohio, with a capital of $200,000, with the following officers: O. C. Barber, President; David R. Paige, Vice-president; Albert T. Paige, Treasurer; J. H. Faxon, Jr., Secretary, and Thomas J. Bray, Superintendent. The company is now making alterations and improvements in the old plant of the Warren Tube Company, and expect to be in condition by October next to supply the trade.

At the meeting of the Western Cut Nail Association in Wheeling, W. Va., on the 10th inst., a new gauge was adopted, by which the number of nails to the pound will be practically the same as the wire nail. This increase, together with the lower price at which cut nails are furnished, is expected to aid materially in stimulating the demand for cut nails. A new schedule of prices for the various sizes was referred to a special meeting to be held on the 24th inst.

The blast furnace at Tonawanda, near Buffalo N. Y., is to be put in blast about August 1st, by the Tonawanda Iron and Steel Company. This furnace was built by the Niagara River Iron Company in 1873, but it was in blast only a short time. It is 16x61 feet in size, supplied with Ford stoves, and the equipment has been kept in good order. Under the new management Lake Superior and Lake Champlain ores will be used, with coke as fuel. The new company expect it to turn out 100 tons of strong foundry pig iron daily.

The firm of Brown, Bonnell & Co., Youngstown, Ohio, was dissolved by Judge Robinson on the 6th inst. The plant has been run by Fayette Brown, receiver, since 1883. A year ago stockholders representing one-fifth of the capital stock of $1,500,000 commenced suit to have the corporation dissolved and its affairs wound up. Counsel for Herbert C. Ayer and others tried to have the report of the referees set aside, but the court confirmed the report, and will appoint a new receiver. Receiver Brown will continue to operate the works pending a decision by the U. S. Supreme Court as to his removal.

The Monongahela Furnace Company, recently organized at McKeesport, Pa., have made arrangements to commence work at once on the erection of two blast-furnaces at McKeesport, Pa. William B. Shiller, late of Youngstown, Ohio, was appointed business manager of the company. Wm. Glyde Wilkins, civil engineer, takes charge of all sub-construction, all grading and excavating, all foundation work, together with the laying out of the railroad system, for which he prepares plans and supervises the work. Frank C. Roberts, civil engineer, of Philadelphia, takes charge of the superstructure of the furnaces and their equipment. Engineers are now at work preparing and perfecting the plans, which, when ready, will be forwarded to contractors for bids upon the work to be done.

Our special correspondent informs us that the Philadelphia holders and owners of the first mortgage bonds of the Etna Iron Works, Ironton, Ohio, propose to reorganize the concern, and have issued a circular to the other creditors. It is their intention to include in the reorganization all parties interested in the present corporation, unsecured creditors and stockholders, as well as the bondholders and other secured creditors. The new corporation to be formed on the basis of $1,000,000 first preferred stock, 6 per cent. cumulative; $250,000 second preferred stock accumulative; $400,000 common stock. It is thought that $200,000 in cash will place the company under favorable conditions to obtain good credit and realize the best results possible, thereby giving all parties interested in the old corporation a chance to make good their present investments. The following have been appointed as a committee: Charles S. Hinchman, Clarence H. Clarke, Charles H. Hart, George W. Hall, Micheal H. Hoffman.

The Pelton Water Wheel Company of San Francisco has recently received an order from the Japanese Government for one of its water wheel hoists, similar to those in use in all the principal mines of the Pacific Coast. These hoists are operated by double reversible wheels, with three streams applied to each. The nozzles have separate gates controlled by levers from a central station, giving perfect control of all movements and admitting of such variations of speed and power as may be desired. In this way only the water required to move the load is used, affording great economy of water, at the same time giving ample power for any emergency. They are to operate cages in a double compartment shaft 2,000 feet deep, handling a 6,000-pound load at the rate of 300 feet per minute, and are to be equipped with every known appliance for safety. The Japanese are a progressive people, quick to adopt the most improved mining appliances that experience has proved of value in this country, the above order being the result of investigations made by government engineers sent here a few months ago to examine into modern methods of mining on the Pacific Coast. This company make a variety of smaller hoists adapted to all requirements, that give the same economic advantage over steam that water power affords for running other classes of machinery.

Thomas James, Assistant Superintendent of the Edgar Thomson Steel Works, of Carnegie Brothers & Co., Limited, at Braddock, Pa., has just been granted a patent on an important invention. It is a self-stamper, for stamping rails, and is worked by the machinery of the hot-saws. It is about one foot square, and fits in the curbers. A groove containing steel type in the shape of a semi-circle runs over the top of the apparatus, to which is connected a spring, which is struck every time a rail is run out, and the type on the under side is dropped and the semi-circle turns over, completely stamping the rail. As can be seen, when it turns over it relapses to its former position, and so on. It is a very intricate piece of work, and it has occupied the attention of Mr. James for over a year. It does away with the stampers, and the terrible heat it occasioned them, all that is now required in connection with it being the changing of the type at the proper time. The stampers

received $6 per day. The machine was first put in operation last week at the Edgar Thomson Works, and after a few trials was found to work successfully. It is now being operated continuously. Mr. James is the inventor of the ingot-stripper, used for the stripping of ingots from the molds in the converting department as soon as they have been poured.

Messrs. Spang, Chalfont & Co., Jones & McLaughlin, the Oliver Iron and Steel Company for its Thirteenth street plant, and McCleane & Co., all of Pittsburgh, Pa., have signed the Amalgamated Association scale for one year. The other mills to concede Association terms were the Hubbard Iron Company, Hubbard, O.; Waugh Steel Works Company, Belleville, Ill.; Ohio Falls Iron Works, New Albany, Ind.; Laughlin's and Junction Steel Works, Mingo Junction, Ohio; Coleman, Shields & Co., of Niles, Ohio; Lawrence Iron Company, of Ironton, Ohio, and the Calumet Iron Company, of Cummins, Ill. Messrs. Carnegie, Phipps & Co., operating the Homestead steel plant, have not signed, and have advertised for men to take the places of the old workmen. The firm recently offered a new scale to their workmen, which was rejected, because it reduced wages about 25 per cent. Thirty-one non-union men started to work, but the strikers so frightened the new men that only three of them got inside the mill. The rest ran away, closely followed by the strikers. Trouble is looked for soon. President Weihe and Secretary Martin, of the Amalgamated Association, have established headquarters at the scene, and will do all in their power to prevent disorder. The sheriff has notified the men to keep away from the company's property, under penalty of arrest. The sheriff has posted a proclamation throughout the town of warning against unlawful acts, and the borough council swore in a number of special policemen.

CONTRACTING NOTES.

Proposals for the purchase of 661 tons of steel plates for use in the battle ship "Texas," now being constructed at the Navy Yard, Norfolk, will shortly be published. All bids must be accompanied by a certified check for one-fifth the amount, which will be held as a guarantee for the prompt delivery of the plates. The successful bidder will be compelled to deliver these plates at the Norfolk Navy Yard free of all expense to the government, and at such points as the commandant may decide.

MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.

If any one wanting Machinery or Supplies of any kind will notify the "Engineering and Mining Journal" of what he needs, his "Want" will be published in this column, and his address will be furnished to any one desiring to supply him.

Any one wishing to communicate with the parties whose wants are given in this column can obtain their addresses from this office.

No charge will be made for these services.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning American goods of any kind, and forward them catalogues and discounts of manufacturers in each line, thus enabling the purchaser to select the most suitable articles before ordering.

These services are rendered gratuitously in the interest of our subscribers and advertisers; the proprietors of the "Engineering and Mining Journal" are not brokers or exporters, nor have they any pecuniary interest in buying or selling goods of any kind.

AMERICAN GOODS WANTED ABROAD.

22. Firm in Sydney, New South Wales, wants to take the agency for American hardware and machinery

23. Parties in Sandhurst, Victoria, Australia, want to correspond with manufacturers of the following goods: Blasting and sporting powder, bellows, steel for drills, axle grease, wire and hemp rope.

24. Steam inspection cars; also a machine for making soap and candy cases wanted in Sydney, New South Wales.

25. Grease and oils wanted in Melbourne, Victoria, Australia.

26. Household specialties, lumber, paints, oils, saddlery and carriage hardware, Perth, West Australia.

27. Canned goods, in Sydney, New South Wales.

28. A Melbourne, Australia, house wishes to represent American manufacturers of mining and boring machinery.

29. Christchurch, New Zealand, parties desire to hear from manufacturers of fencing wire or fencing also oils and general merchandize.

30. A Christchurch, New Zealand, house wants mining and general machinery.

31. Two houses in Sydney, New South Wales, wan agencies for American manufacturers.

32. A firm in Hong Kong wants to correspond with manufacturers of goods saleable there.

33. A house in Pekin, China, wants fancy articles and toys, and would like to correspond with American dealers in Chinese curiós.

34. Parties in Trichinopoly, India, wish to correpond with American house that will buy Indian gars.

35. A firm in Rangoon, Burma, wants agency for American goods.

36. A merchant in Ceylon wants to correspond with American manufacturers.

37. A correspondent in Barbadoes, West Indies, wants agencies for American goods of all kinds.

38. A firm in the City of Mexico wants to correspond with manufacturers of hardware, agricultural implements, etc.

39. Mexican house wants blasting powder and fuse.

40. House in Panama wants catalogues and prices of goods adapted to their market.

41. Two firms in British Honduras will take the agency for general American wares, particularly articles of domestic utility.

42. A firm in Buenos Aires, Argentine Republic, would like to hear from American manufacturers desiring to be represented there.

43. A mercantile house in Chili, S. A., wishes to correspond with manufacturers of agricultural and mining machinery

44. The president of a railroad company in the Hawaian Islands wants catalogues and price lists of American railway supplies.

45 A house in the United States of Colombia would like to establish "commercial intercourse" with American manufacturers.

46. Mill engine, coupled at 120 degrees, 20 pounds steam to 1 ind. H. P., guaranteed one year; 3-cylinder engine, one of 24 inches diameter, high pressure, 5-foot stroke; two of 30 inches diameter, low pressure, 1,000 ind. H. P., with 150 steam, 50 revolutions; two 24-foot fly wheels (band wheels), one being 5 feet 3 inches wide, the other 3 feet 2 inches wide. Bolivia.

47. Hoisting engine, maximum capacity 375 tons in 20 hours from depth 2,000 feet in load, maximum 2 tons (2 cars of 1 ton each); direct-acting compound double tandem cylinder, 16 inches high pressure, 36 inches low pressure, 48-inch stroke, cut off at ⅛; two friction drums, 4 feet diameter, 3-foot horns. Bolivia.

48. Eight winze hoists, eight winze pumps, air pipes, column pipes, belting, hose, etc. Bolivia.

49. Compound water pumping engine, to lift 150 feet high. Bolivia.

50. Air compressors (duplex-compound), Corliss-tandum-coupled at right angles. Two air cylinders, 20 inches diameter; high-pressure cylinder, 20 inches; low pressure, 35 inches, 48-inch stroke, with fly wheel, 20 feet diameter, weighing not over 40,000 pounds, engine to cut off up to 4-10 on high-pressure cylinder. Independent compressor and pump. Bolivia.

51. Boilers, six 8 feet diameter, 12 feet long by 3 feet. Corrugated flue under 1,000 H. P., with evaporation of 12½ pounds water to 1 pound Welsh coal. From 120 degrees, sea level, 180 pounds pressure. Bolivia.

52. Six Boilers, 6 feet by 15 feet, tubular, 81 tubes. Grates, 5 feet by 6 feet. Return tubular, with cast front, complete, to evaporate 14 pounds water to the pound of coal (coal costs $50 per ton, gold); 15,000 feet above level of the sea. Bolivia.

53. Exhaust fan and blowers, for dust of battery and roll, and blowers for boilers and gas producers. Bolivia.

54. Stamp mill, 100 stamps, 1,000 pounds each, in 10 batteries, complete. Steel cams, tappets, heads, shoes and dies, iron frames, charcoal, iron or steel motors. Bolivia.

55. Two 10-inch by 20-inch Blake crushers, four 6-inch by 20-inch Blake crushers, five pairs of 36-inch by 14-inch rolls, one salt dryer, revolving cylinder, 5 feet by 30 inches; four ore dryers, revolving cylinder; four ore conveyors, 50 feet long by 24 inches diameter, revolving pipe. Bolivia.

56. Eighteen rock drills with posts, arms, tripods, etc., complete. Bolivia.

57. Surface condenser, 4,000 square feet cooling surface, tinned brass tubes, independent direct acting pump. Bolivia.

58. Melting works—two 3 by 8 feet by 15 feet high Raschette water jacket blast furnace, one 36-inch round furnace, 15 feet high. Complete with slag pots, movable well, two cupel water jacket furnaces, three slag roasting furnaces. Bolivia.

59. Roasting furnace, for chloridizing; roasting 150 tons a day (5 per cent antimony, 35 per cent sulphur).

60. Amalgamating pans, etc., or tins, thirty 6 feet dia., fifteen 10 foot settlers, three clean-up pans, two quicksilver pumps, two agitators, one amalgam. press, retorts for 6 tons amalgam. per day, line shafting and pulleys. Bolivia.

61. Gas producer, ten, for soft coal: each to burn 2 tons in 24 hours. Bolivia.

62. Mine cars—20 steel mining cars to carry 13 cubic feet; 14 inch-steel wheels and steel axles. Bolivia.

63. Rope, 5 by 318 flat, crucible steel. Bolivia.

64. Wheelbarrows. Bolivia.

65. Wooden houses for workmen, fifteen, each with 2 rooms, 12 feet by 18 feet, with 10 foot by 12 foot kitchen. Fifteen with 2 rooms, 13 feet by 18 feet. One boarding house, 30 feet by 60 feet; single story. Bolivia.

66. Office and house furniture. Bolivia.

67. Carts for transporting metal, with hickory wheels and iron box of a capacity of 8 to 9,000 lbs., such as are used for this purpose in Colorado and Nevada. Bolivia.

GOODS WANTED AT HOME.

68. Nickel and cobalt ores and furnace products wanted. New York.

69. Boiler and engine with wood and iron working machinery. Alabama.

70. Boiler and engine, 4, 6 or 8 H. P., second hand. Virginia.

71. Pump, with a capacity of 200 to 500 gallons per minute: boiler and about 250 feet best 2-inch hose, with couplings. Florida.

72. Two steam tank pumps, 18-inch steam cylinder, 12-inch water cylinder and 24-inch stroke, and two steam boiler feed pumps, 10-inch steam cylinder, 6-inch water cylinder and 12 inch stroke. Ohio.

73. Machinery for mining asbestos and ochre. Maryland.

74. Oil washer for manganese which will save ore smaller than cherry size; also a revolving screen and wire gauge. Georgia.

75. Ice machinery. Mississippi.

76. Well-sinking machinery. Alabama.

77. Parties in Tennessee want bids for sinking gas well 1,500 feet deep.

78. Cars, locomotives, and general railway equipment are wanted in Tennessee, Arkansas, Michigan, Florida, and Alabama.

79 About ten or twelve miles of iron or steel rails, 24 to 32 pounds, new or secondhand, with complete fastenings, etc.; a light switch engine and a few cars. Arkansas.

GENERAL MINING NEWS.

A special from Chicago to the *World* says: "The Standard Oil Trust has fastened its octopus-like tentacles on this city. The latest benefit obtained by this gigantic trust has been given away by the Common Council without any remuneration to the taxpayers, though it is said that the thirty aldermen who voted for the ordinance were 'seen' by the representatives of the trust in this city. The trust was given the exclusive privilege of laying a pipe line through the city, and maintaining it for twenty-five years. All that was asked in return was an indemnity bond of $100,000. The common report was that the thirty affirmative votes cost $30,000.

Shipments of iron ore from the mines of the districts mentioned below for the season up to and including July 3d, as reported by the Marquette *Mining Journal*, were as follows:

	Tons. 1889.	Tons. 1888.
Marquette, Marquette District....	518,071	*
St. Ignace, " " ..	16,865	
Escanaba, " "	352,040	*
" Menominee District....	593,863	*
" Gogebic District.....	96,442	*
Ashland, " "	488,146	*
Two Harbors, Vermillion District.	285,549	*
Total, tons.....	2,350,796	*

*Figures not published.

CALIFORNIA.

AMADOR COUNTY.

The Zeile sulphurets works have been started up. The work of repairing the shaft is completed, and all the stamps of the mill will shortly be in motion once more, for a long and continuous run.

ALLISON.—This mine, above Big Bar Bridge, owned by Messrs. Tripp & Petrie, is running on low grade ore, which does little more than pay running expenses. There is said to be plenty of better rock in the mine, below the tunnel level. Sinking operations will have to be inaugurated before this can be worked.

ALPHI.—It has been decided to erect a five-stamp mill, and Mr. B. F. Taylor has been authorized to make the necessary arrangements.

CLEVELAND.—The operations on this cement and gravel claim, at Volcano, are likely to bring the camp into prominence once more as a mining center. The roller mill was started on its career of pounding out the gold from the hard cement, and it not only works well, but the yield of gold is said to be satisfactory. There are between 20 and 30 men employed on this claim.

LOYAL LEAD.—This property in the Black Hill, near Drytown, has been bonded to an English company for four months for $40,000.

PLYMOUTH CONSOLIDATED GOLD MINING COMPANY.—Secretary Henry W. Lazelle furnishes us the following financial statement to July 1st: Gold bullion produced in June, $15,675.67, making a total of $82,503 29 for the first six months of 1889. Indebtedness, January 1st, 1889, $15,446.93; January expenses, $4,651.03; February expenses, $5,839.56; March expenses, $7,760.66; April expenses, $7,528.87; May expenses, $7,395.42; June expenses estimated, $8,000; total, $56,622.47; surplus, $25,880.82.

KERN COUNTY.

A terrific conflagration visited the town of Bakersfield on the 7th inst., and utterly destroyed that flourishing place. Bakersfield is the county seat of Kern County, and the most prosperous town in the San Joaquin Valley.

COLORADO.

I. X. L. MINING COMPANY.—Mr. James E. Blythe, treasurer of this company, has notified holders of the bonds that the interest coupon, No. 1, attached to bonds Nos. 1 to 250, will be paid on and after the 8th inst. on presentation at the Continental National Bank of St Louis.

BOULDER COUNTY.

Dr. O. N. Hartshorn has started his new mill at Boulder. The low grade gold and silver ores are to be tested by the Birmingham process, which was referred to in the ENGINEERING AND MINING JOURNAL of July 14th, 1888.

CLEAR CREEK COUNTY.

Mr. Peter Van Dyk, Mining Engineer to the Government of Holland, and Baron Van Zuylen, one of the trustees of the Colorado Central Consolidated Mining Company, are making a thorough examination of the company's property. This company has been a

very steady dividend payer and has just declared its twenty-ninth dividend, and from the conservative and economical management it is likely to remain long in the list of dividend payers.

GUNNISON COUNTY.

SYLVANITE.—It is reported that arrangements have been made with the owners of the Moss Rose No. 2, whereby the Sylvanite mine will be worked through their ground; work will be started up at once.

DAKOTA.

Private advices from Dakota inform us that several Dakota enterprises which have of late been brought prominently to the attention of the public are more or less "crooked." Our correspondent promises to furnish us full information concerning the same at an early date. We publish this as a warning to investors.

PENNINGTON COUNTY.

Word has been received in New York to the effect that the recent purchases of tin properties in this county by English capitalists is for a French company which will shortly be organized in Paris.

HERMOSA GOLD PLACER COMPANY.—The Rapid City *Journal* has the following: "The following board of directors has been elected for the year 1889: E. L. Sawyer, Frank Erdman, Frank L. Chadwick, of Rapid City; Peter Johnson, of Hayward; G. R. K. Smith, W. H. Johnson, William Buck, of New York. The following officers were elected: F. L. Chadwick, President; W. H. Johnson, Vice-President; E. L. Sawyer, Treasurer; C. W. Bryden, Secretary. A report of the condition of the company shows that it has paid twenty dividends of five thousand each, is entirely free from debt and has a showing of $100,000 cash dividends to date."

In addition to the above, the ENGINEERING AND MINING Journal is informed by Mr. G. W. Chadwick, the lessee of the property, that dividend No. 21, paid in New York City, July 5th, makes the total amount of dividends paid to date $105,000. Dividends of one cent per share, or $5,000, have been paid for twenty-one consecutive months. The company was organized in August, 1887, by Mr. Chadwick, see ENGINEERING AND MINING JOURNAL, October 29th, 1887, with a capitalization of $1,000,000, divided into 500,000 shares of $2 each. There are from fifty to seventy-five stockholders. The company is incorporated under the laws of Dakota, and the stock is therefore assessable. The property, Mr. Chadwick informs us, is in Battle River Valley, Pennington County, and consists of placer ground about 11 miles in length, and from one-quarter to one and one-half miles wide. There are eleven miles of flumes and ditches. The three flumes are located along Battle River and in Rich and Iron gulches, and all converge at the town of Hayward. The entire plant and property, since the organization of the company, has been leased to Mr. G. W. Chadwick, who guarantees to pay all expenses, including the cost of all necessary improvements, and also returns a rental to the company of $5,000 per month for dividend purposes. After September 1st, Mr. Chadwick says that this sum will be increased to $7,500 per month. Mr. Chadwick purchased the property himself in 1887, and he says that he paid $200,000 for it. The company was formally organized in August of that year.

In this as in the case of the other Chadwick enterprises we think the investing public should require some confirmatory evidence from competent, disinterested sources before considering the investment seriously. This story closely resembles that told by Mr. Chadwick concerning his Big Bend property four years ago, and the subsequent history of the enterprise is well known.

ILLINOIS.

The great strike of miners in the Braidwood coal region is about to be broken. The sheriff of Joliet was called upon to protect some seventy-five miners who had affixed their names to an agreement to resume work at the Godley mine of the Chicago, Wilmington & Vermillion Coal Company, at the price set by the operators, 85 cents per ton.

The Coal Run Company, which some time ago proposed the plan of profit-sharing to its employés, has, since the rejection of that scheme, signified its willingness to arbitrate. At a mass-meeting of the miners, held at Streator on the 9th inst., it was decided by an almost unanimous vote to approve of an arbitration between the Coal Run Company and its employés. This company only employs 200 men, but as the issues involved are mainly the same as with other mines, the settlement for one will be practically the settlement for all. The board of arbitration will be composed of three men, one to be chosen by the company, one by the miners, and these two to choose the third. Their award must be made on or before August 7th, and pending their decision the Coal Run Company's miners will resume work at the old prices.

INDIANA.

All negotiations between the coal miners and operators and their arbitration friends at Brazil are now considered off. The operators, in the judgment of the State Board of Charities, offer the highest price that can be paid, but the miners persist in refusing. The operators will introduce machines as the only alternative. The operators offer 70 cents and 75 cents for pick mining.

It is not expected that the efforts of the State Board of Charities to settle the miners' strike by arbitration will be successful. The men will not go to work at the prices offered, and the operators will not abide the arbitration, declaring that if an advance is ordered they can not pay it. Arrangements are now being made to put machinery into their mines.

MICHIGAN.

COPPER MINES.

LAKE SUPERIOR MINING COMPANY, LIMITED.—This company has been organized in London with a capital stock of £20,000, in £1 shares. The object is to acquire the mineral tracts of Cape Mamainse, situate on the east shore of Lake Superior, the property of the Lake Superior Copper Company, in liquidation.

MINNESOTA.

ST. PAUL & PACIFIC COAL COMPANY.—On July 5th this company's dock at Duluth was damaged by fire to the extent of $60,000.

MONTANA.

LEWIS & CLARKE COUNTY.

MONTANA COMPANY, LIMITED.—The company has just issued a circular dated June 25th: The directors, having received from the resident director at the mine an approximate estimate of the company's financial position to the 30th June, are enabled to declare a further dividend for the current half year of sixpence per share, free of income tax, payable on the 15th July, 1889, being at the rate of 10 per cent per annum. Resident Director's Report.—The following extracts from Mr. R. T. Bayliss' latest reports will be read with interest: "Professor Clayton has been paying me a friendly visit and made an unofficial inspection of the 800-feet level, after which he informed me that he was exceedingly gratified to notice the developments, and that they confirmed him in the opinion expressed in his report that there was every reason to expect both large and valuable discoveries in the mine, as it was developed in depth."

The No. 1 Shaft—800 feet Level South.—"The drift in this level is still being advanced in the No. 1 shoot, and continues to present the most encouraging appearance. The ore body is from 8 to 9 feet in width, and continues of a fair grade, and fit for the purposes of the 50-stamp mill. This shoot is now proved to a length of upward of 200 feet, which is considerably larger than it has been proved to be at any point above." 600-feet Level North.—"The Pixley No. 4 shoot in this level has been opened out into a very fine ore body, and shows a very marked improvement over the appearance which was noted in the same shoot on the 500-feet level. It is about 18 feet wide, and of a very good grade of ore. The north end of the 800-feet level on the Castletown lode has been rapidly advanced during the past week, but has not developed into an ore body of any value. The quartz has a very improved appearance, and looks as though it might improve any minute, but at present it is not sufficiently rich for milling purposes. "The No. 2 shaft—800-feet level.—"The north end of this level is being avanced as rapidly as possible, double shifts being employed upon it in order to intersect the Sampson ore body. No work has yet been done upon the south end, as the air at the bottom of the shaft is not particularly good, and whilst we are working the drills on the north face, it would be almost impossible to operate the south end as well. "The 600-feet level.—"I am now restarting the 600-feet level south, in the hope of intersecting the ore body found in the 500-feet level." Seven hundred-feet Level South.—"The ore body which we have encountered appears to be about 8 or 9 feet wide, and is a very fair grade of high grade rock. I am looking forward with great hope to adding to our ore reserves by this discovery a considerable quantity of high grade ore between the 600 and 700-feet levels." "The ore body in the face of this drift referred to in my last report is giving signs of weakening, and it is not improbable that we have reached the southern extremity of the No. 1 south shoot in this level." Five hundred Level South.—"This drift has entered an ore body, which is about 9 feet wide, and contains a streak of ore for about one-half of its width, which is of fair high grade; and as this ore body has not been encountered above, we are entirely in the dark as to what may be in front of us; but it has the appearance of having come to stay, and is the most important development which has been made in the mine for the last six months." The 500-feet Level South.—"This drift continues to be advanced in the ore body. An average sample taken from the face gives an assay value of $25, nearly all in gold, and the general character of the ore body gives the impression that it is going to be both a large and valuable discovery." Five hundred-feet Level South—"This level still continues to be advanced in the ore body lying south of the Jubilee Shoot, which has now been proved to a distance of 70 feet, and which not only makes a very substantial reserve, but holds out great promise for further development in the lower levels." "All developments and works below and above ground are proceeding in a very satisfactory manner, and give promise of continued prosperity in the future."

SILVER BOW COUNTY.

BOSTON & MONTANA CONSOLIDATED COPPER AND SILVER MINING COMPANY.—"A statement of the company, privately circulated," says the Boston *Herald*, "is said to show a balance of profit July 1 or thereabouts of some $380,000. The company is believed to be doing remarkably well. One who knows says the company can earn $8 per share, with copper at 12c., and can pay $4, and the surplus, together with the proceeds of $500,000 bonds to be sold to shareholders at, say, 90, will be sufficient to build the new smelting plant. By the time this is completed the latter's credit of the Barings may expire, but Boston and Montana will be in a position to compete with all comers in copper production and certainly in the price of copper. Such at least is the calculation."

The "street" does not take quite so "booming" a view of things.

NEVADA.

INDIAN QUEEN MINING COMPANY.—It is expected that this mine, near Benton, will soon be in operation with a large force of men. The mine turned out a great deal of bullion some years ago, but not much has been done there of late.

ELKO COUNTY.

[From our Special Correspondent.]

BELLE ISLE MINING COMPANY.—This company has a quantity of good ore in the stopes, and ought to be selling for a higher figure.

COMMONWEALTH MINING COMPANY.—This mine is still shipping bullion, but remains in debt.

DEXTER MINING COMPANY.—This mine is shipping high grade ore to California for reduction.

EYRIE.—Messrs. Smith and Kerr, of this mine, have been shipping their ore, which is unusually rich, to Reno for reduction. Last shipment they realized about $40,600. Eyrie is near the Navajo; the ore is a wonderfully rich "horn silver," with large percentage of gold; deeper it is a sulphuret. About eighteen men are employed.

GRAND PRIZE MINING COMPANY.—This mine is yielding the usual grade and quantity of ore. An upraise on west drift 400-foot level has struck favorable vein matter. Concentrating works will start up soon.

NAVAJO MINING COMPANY.—The south drift west vein 350-foot level is showing faces of good ore. Upraise or east vein is also showing good ore. A very small force is at work, and although the mine had $13,000 to its credit in the beginning of May, to-day finds it $809 65 in debt. Why is this so? Fifty feet of work last week, 20 feet drifting, 30 upraise. Why is the Navajo mill closed down?

NORTH BELLE ISLE MINING COMPANY.—This company is sinking to get ore lower. Important work has been commenced on the 500 level, where a crosscut will be run 45 feet south of the Nevada Queen line. As this level corresponds with the 550 level of the Queen, where a vein of rich ore has already been cut, a valuable development is expected.

YOUNG AMERICA.—Some parties have got a lease on the old mine, which used to be known as the Young America some years back. They expect to strike the old leads and get the same grade of ore as is being taken out of the Dexter, gold principally.

COLUMBIA DISTRICT.

C. W. McMasters has taken a car load of ore to Salt Lake City for treatment from the new find in the above district.

MERRIMAC DISTRICT—LONE MOUNTAIN.

A smelter is needed in this district.

BEN HARRISON.—Mr. S. G. Weston has shipped ten tons of galena ore to Reno for reduction from this mine, which he expects to work up to 50 per cent lead and 35 ounces silver.

MERRIMAC.—This mine is showing 4 feet of high grade copper silver ore in the new shaft. Twenty or thirty tons will be sent to Denver as a test.

NEW MEXICO.

GREY EAGLE MINING COMPANY.—At the meeting of this company a committee was appointed to obtain the consent of the bond-holders to an agreement to sell the mine, the intention being to buy it for their benefit and reorganize the company.

SANTA FE COUNTY.

SANTA FE COPPER COMPANY.—This company has sold to a syndicate $200,000 of its first mortgage bonds, the proceeds of which sale will be devoted to procuring necessary machinery to properly equip the mine, thereby increasing its output and greatly reducing the cost of production. The officers claim that when the new machinery is at work, copper can be produced at 6¼ cents per pound laid down in New York. The machinery hitherto in use has been of the crudest description, and the company has labored under very serious disadvantages in consequence; but notwithstanding this fact, and the very heavy charges for freight from the mines to Los Cerillos (the nearest railroad point), the company has shown a profit every month from its mining operations. A railroad from the mines to Los Cerillos is contemplated, and it is expected that before the end of the present season it will be finished; this will very materially cheapen the cost of production. The proceeds of to-day's sale of bonds will pay the company's floating indebtedness, which was not large, and there will remain in the treasury for future needs $100,000 of bonds, and nearly 100,000 shares of the stock. The sale to-day is said to have been a very good one for the company and is very satisfactory to its officers. The reason that the June product of the Santa Fe mine was a little below the average monthly output was owing to a break-down, and the first two weeks of the month was spent in repairing one of the furnaces. In the last half of the month both furnaces were running. Figures of the operations of the Santa Fe mine since production was resumed are as follows:

1888.	Ore Tons.	Per cent. Matte.	Fine copper. Pounds.
December	235	49	236,300
1889.			
January	315	49	308,700
February	430	48	412,800
March	460	42	386,400
April	516	43	443,760
May	354	48	339,840
June	339	53	359,340
Total	2,649	....	2,481,140
Average	378½	47½	325,877

An official of the Santa Fe mine states that the company is at work fitting up and equipping the mine for cheap production, and that in about three months the company expects to be able to produce 600 or 650 ton

of 53 per cent matte per month, which will yield about 700,000 pounds of fine copper.

NEW YORK.

MONTGOMERY COUNTY.

According to reports oil has been discovered at Rural Grove, in the town of Root.

PENNSYLVANIA.

QUAKER CITY SLATE COMPANY.—The sheriff of Berks County on the 10th inst. levied on the extensive slate quarries of this company, of Albany Township. The stockholders are mostly Philadelphians, and the levy was made on an execution for over $5,000 in trust for William B. Shaffer, President of the company.

COAL.

The Miners' Examination and Registration law in the anthracite region of Pennsylvania promises to work a revolution in the question of the supply and demand of labor. By compelling the examination of every applicant for work in the region as to his fitness and experience it excludes the unskilled and irresponsible, who have been a contributing element in so many mine disasters. It will go still further and prevent the wholesale importation of the ignorant, incompetent, and undesirable foreigners who have overrun portions of the anthracite district.

Forty coal miners, representing, it is stated, 14,000 miners of the districts of Blair, Cambria, Clearfield, Centre and Jefferson counties, met in Altoona on the 8th inst. They concluded not to enter into a general suspension, but decided to call out all miners who are working under the district prices.

CONNELLSVILLE COKE AND IRON COMPANY.—The H. C. Frick Coke Company, the largest in the Connellsville region, has gobbled up all the interests of the Connellsville Coke and Iron Company, owned by the Leisenrings, of Philadelphia. This concern was one of the four members of the great coke syndicate which controlled the market for years, and which was disbanded a year ago. By the purchase of this plant and property the Frick Company becomes one of the largest coke producing concerns in the world, as they now own about 7,000 coke ovens and over 25,000 acres of coal land. The property purchased consists of 10,000 acres of coal land and 1,500 ovens.

OIL.

Exports of refined, crude, and naphtha from the following ports, from January 1st to July 6th:

	1889. Gals.	1888. Gals.
From Boston	2,468,149	1,498,198
Philadelphia	63,614,507	57,052,807
Baltimore	1,888,349	3,641,852
Perth Amboy	9,690,737	11,780,944
New York	207,479,595	178,314,685
Total exports	285,141,337	252,288,486

A movement has been started in Franklin having for its object the celebration of the thirtieth anniversary of the striking of the first oil well by Colonel Drake. It will be just thirty years on the 20th of next August since the first well was completed on Oil Creek, near Titusville. All the producers in the country will be asked to participate, including the Standard Oil Company.

TENNESSEE.

The strike of the coal miners in the Jellico mining region came to an end on the 8th inst., and 1,000 miners resumed work at the price they were receiving before the strike began last April. All the coal mines in the vicinity of Knoxville are now in operation with a full force of miners.

FOREIGN MINING NEWS.

SOUTH AFRICA.

The results of the crushings at 16 of the principal mines of South Africa during the month of May from 395 stamps working amounted to 25,004 ounces gold, as against 16,658 ounces in April. The greatest increase was 3,235 ounces at both Robinson's and the Langlaagte. The returns from all the Rand mines is given as 35,700 ounces, which is the largest yield on record. The export of gold from Natal and the Cape for the first four months of the present year was valued at £423,089, as against £360,746 during the same period of last year. During the month of May, 1888, the export of gold represented £86,263, which, however, was surpassed in May, 1889, the amount then being £128,593.

SOUTH AMERICA.

REPUBLIC OF COLUMBIA.

EL CRISTO GOLD AND SILVER MINING COMPANY.—Treasurer Harpending informs the ENGINEERING AND MINING JOURNAL that 266 sacks of first-class ore were received in New York on Monday. This ore is the first taken from the 200-foot level and the treasurer of the company says that it is richer than usual. We are also informed that the new steam hoisting and crushing plant will be completed during the present month. The crusher is expected to crush 50 tons of ore per day to a size suitable for sacking and will do away with the labor of women and boys, which has heretofore been used for this purpose. There is still some difficulty in securing proper transportation facilities.

ORE MARKETS.

Duty on Mexican Ore.—The *Herald's* correspondent at Washington says: From the closest information I can get, it seems probable that the Treasury Department is about to decide the Mexican ore case adversely to the smelters engaged in the free importation of such ores. The political pressure for such action upon Secretary Windom has been very great, the party managers deeming it important that the silver States shall be conciliated in this matter, if possible, in view of the slight hold that the Republicans have upon the House of Representatives and the virtual demand made by the silver barons for the breaking up of the importation of these Mexican ores as the price of their loyalty to the party.

Just how the carbonate men are to be placated between now and the time of the organization of the House of Representatives is not yet settled, and probably cannot be until the return of the First Assistant Secretary Tichenor to the Treasury Department, a week or so hence, as the matter is in his especial charge, and he is the best informed upon the many points raised by one side or the other in the course of the protracted and fierce discussion. I am informed that the department is not acting entirely upon the interested statements furnished by the respective parties to the controversy, but has been quietly making some inquiries of his own, and that whatever action is taken will be mainly based upon the facts and suggestions officially authenticated.

FINANCIAL STATEMENTS.

The following statement shows the financial balances of the principal mining companies having offices in San Francisco on July 1st and on June 1st, 1889. The comparison shows what progress has been made toward a dividend paying position.

CASH ON HAND.

	June 1st.	July 1st.		June 1st.	July 1st.
Alpha	$ 7,127.41	$3,667.40	Ind'ence.	$1,509.34	$1,357.59
Alta	42,651.58	32,038.99	Julia	.....	4,945.05
And'ns	4,411.37	3,453.97	Justice	.....	15,225.39
Belcher.	8,722.62	.....	Loco'tive	4,164.16	4,249.06
Belle I.	2,330.24	1,921.79	Lady W	22,887.68	22,615.18
Bulwer.	16,210.07	13,514.90	Mex'can	9,478.54	1,533.59
Benton.	94,322.82	94,138.02	Mono	23,409.68	17,468.06
Bullion.	18,229.19	14,786.19	Navajo.	c. c.	
Bodie C.	39,104.61	39,104.61	Ophir	.....	37,261.48
Crocker.	927.27	.....	Ov'man.	8,139.88	3,412.78
Con. Cal. & Va.	a78,235.28	d87,064.52	Occi'tal.	36,618.34	35,641.00
Cale'nia	10,115.14	10,115.14	Peer	717.49	.....
C'nfid'ce	23,497.95	16,236.96	Peerless	10,933.95	f2,268.43
Diana	4,440.95	4,440.95	Potosi	6,856.46	34,864.93
E. Sierra Nev.	.....	1,313.23	Sco'pion	.....	1,313.47
Exch'er.	22,892.00	19,441.75	Silv. Hill	.....	16,265.00
Gould & Curry.	1,194.14	21,170.19	Sil. King	47,553.76	1,313.47
Hale & N	b50,438.31	e57,020.51	Stan'ard	7,871.32	39,873.23
Found Treas.	.....	2 167.65	Sierra N	3,740.41	8,400.49
Imperial	12,511.81	8,470.00	St. Louis	.....	2,312.00
			S'ndic'te	.....	8,342.5
			Utah C.	8,171.84	2,504.5
			Un. Con.	.....	16,560.53
			Weldon.	.....	6,413.30

a And $133,409.89 in unsold bullion with further shipments to arrive.

b With full bullion product and expenses of the mine for the month not reported.

c Overdrawn $177.82, but have bullion unsold amounting to $14,500.

d Cash in bank and unsold bullion on hand valued at $66,514.80, with further shipments to arrive before the close of the fiscal month and operating expenses unpaid.

e With bullion yield of the mine and May expenses not yet reported.

f In cash and $13,828 in unsold bullion.

INDEBTEDNESS.

	June 1st.	July 1st.		June 1st.	July 1st
Belcher.	$	$ 1,366.88	Navajo.	$	$69.85
Best & B	5,235.41	10,535.41	Nev Q.	51,687.18	50,754.98
Chal'ge.	7,606.17	11,517.00	North C'nw'h	7,497.94	171.93
Crown Point.	16,411.38	38,816.62	N. B. I.	29,323.00	33,179.57
C'mw'th	61,884.22	a43,545.20	Ophir	5,613.03	.....
Con. N. Y	9,704.46	11,240.50	Peer	.....	538.05
Chollar.	16,611.85	30,536.11	Sierra N	.....	1,523.46
Crocker.	.....	1,131.03	Savage.	.....	41,030.73
Del Mo.	9,162.68	11,028.06	Seg. Bel. & M.C.	.....	24,508.79
Grand P	29,911.37	30,393.83	Weldon.	1,129.61	.....
Holmes.	4,290.38	4,545.58	Union	1,648.07	.....
Kent'ck	.....	3,792.08			

a With $16,000 in bullion in transit and further shipments to arrive.

ASSESSMENTS.

COMPANY.	No.	When levied.	D'l'nq't in office.	Day of Sale.	Amn't per share.
Andes, Nev	35	June 12	July 18	Aug. 8	.25
Baltimore, Nev	5	July 2	Aug. 5	Aug. 24	.25
Best & Belcher, Nev	43	June 6	July 11	Aug. 1	.25
Crocker, Ariz	6	June 14	July 19	Aug. 13	.10
Equitable T., Utah	34	May 14	June 20	July 15	.05
Eureka Cons., Nev.	12	June 12	July 15	Aug. 7	.50
Golden Fleece, Cal.	14	May 21	July 20	Sept. 16	17.00
Goodman, Nev	6	June 15	July 20	Aug. 24	.05
Nevada Queen, Nev	5	June 3	July 9	July 30	.50
North Belle Isle, Nev	15	June 27	Aug. 1	Aug. 22	.30
Platt & Gilson, Cal.	1	June 20	July 22	Aug. 7	3.00
†Pinal Cons., Ariz	55	May 15	June 21	July 12	.05½
Original, Nev	12	June 12	July 25	Aug. 14	.25
Seg. Belcher, Nev.	95	June 4	July 8	July 29	.25
Sierra Nevada, Nev.	38	June 7	July 11	July 31	.25
Union Cons., Nev	13	May 13	June 19	July 10	.25

* Delinquent day and day of sale postponed to dates given above.

†Notice is given that assessment No. 8, of ten cents per share, levied April 13th, 1889, upon the capital stock of the Pinal Consolidated Mining Company was rescinded by the directors at a meeting held May 15th, 1889.

DIVIDENDS.

The following have been declared:

Caledonia Gold Mining Company, of Dakota, dividend 13, eight cents per share, or $8,000, payable July 26th, by Messrs. Laidlaw & Co., 10 Wall street, City.

Colorado Central Mining Company, No. 29, five cents per share, or $13,750, payable August 12th, at Farmers' Loan & Trust Company, 22 William street, N. Y. City.

Montana Company, Lt., of Montana, No. 16, sixence per share, or $82,500, payable July 15th.

Poorman Mining Company, of Idaho, Dividend No. 1, of three cents a share, or $15,000, payable July 15th.

The Cœur d'Alene Silver-Lead Mining Company, of Idaho, dividend No. 1, of three cents a share, or $15,000, payable July 15th.

MINING STOCKS.

New York.

FRIDAY EVENING, July 12.

There is very little in the way of news to report concerning the market for mining shares in this city. Prices during the week have been generally steady and sales of about the usual volume. No meeting was held by the Committee on Mining Securities this week, but we have it from the committee's courteous chairman that the executive knife is being sharpened, and the slaughter of the "cats" will shortly be commenced, to which we heartily say, "So mote it be," Mr. Chairman, and let us have a list of securities as free from blur or blemish as honesty, care and independence can make it. When the Exchange will admit only sound and honestly managed enterprises to quotation, it will benefit the mining industry and create an interest in mining securities, and the ENGINEERING AND MINING JOURNAL will warmly second its efforts to attain this end.

The Salt Lake *Tribune* of July 3d has the following: For some time past there has been a difference of opinion among the directors of the Horn Silver Mining Company as to what disposition should be made of the funds, representing the earnings of the mine, in the treasurer's hands. The three directors here were in favor of devoting it to making small quarterly dividends, while the four New York directors favored loaning the money out. In May last the Eastern directors passed a resolution authorizing James T. Little, director and treasurer, to loan out the money on hand. He found upon investigation that under the law the company had no right to make loans, and in reply suggested that the money ought to be distributed among the stockholders in dividends. He also stated that should he loan the money, and should any loss result, he and his bondsmen would be liable, and he did not care to assume any such responsibility. The directors then held another meeting, and passed a resolution relieving Mr. Little from all liability for any loss, but he found that they had no power to relieve him and wrote to that effect, at the same time tendering his resignation as treasurer and director, and asking that his successor be appointed at once, to whom he would turn over all funds. On June 25th last the board met in New York and accepted Mr. Little's resignation and appointed A. I. Harrison to succeed him. Mr. Little was instructed in send the funds in his hands on to New York, and yesterday he remitted $183,602.93, that being the total amount on hand. The mine has been paying well this year, the net earnings amounting to about $100,000, and the local directors favored the idea of paying two quarterly dividends of 10 cents per share, but it seems this will not be done, as the Eastern directors want $150,000 kept on hand as a working capital as well as dividends for a year ahead before declaring dividends. Mr. Little tendered his resignation simply to protect himself from any loss that might result from loans made by him as treasurer, and stockholders, as well as directors, regret losing his services. The stock in the New York market has been quite active, and was firm at from 93c. to $1.

Eureka Consolidated declined this week, on the news that the smelting works of the company at Eureka, Nev., had been almost totally destroyed by fire. Later advices report that the fire was confined to the two furnaces and the ore bin, which, however, were entirely ruined. The loss is estimated, unofficially, at from fifty to seventy-five thousand dollars, partially covered by an insurance of $30,000.

The fire occurred on Sunday last; its origin is unknown. This disaster is but one of many embarrassments that have overtaken the company during the past year, and coming as it did, just at a time when the horizon of the company's future seemed to be clearing, it is extremely regrettable. But one sale of the stock is reported at $2.20.

The Sutro Tunnel Stock and Trust Certificates are attracting no attention. A few sales of the former were made at 6@7c.

Consolidated California and Virginia advanced in the beginning of the week from $7.50 to $7.87, but later declined to $7.38, again closing at $7.75. Chollar advanced from $1.35 to $1.50.

Utah declined from 90c. to 85c. Potosi from $1.70 to $1.65. Occidental was firm at $1.75. Mexican at $3.45. Best & Belcher at $3.40.

North Belle Isle shows a few transactions at from $1.05 to $1.15. Commonwealth is firm at $4.

The only business done in the Colorado stocks was in Iron Silver at $2; Small Hopes has advanced to $1.20, and Plutus has declined to 82c.; Little Chief ruled at 30@32c.; Denver City at 8c., and Cashier at 4c.

Silver King, as already mentioned, is now in the hands of the Bonanza firm, and they are keeping the price firm at from 95c. to $1.05.

The Colorado Coal and Iron Company is having its affairs put on a sound business basis by Mr. Edward Berwind, President. Pretty radical and much needed changes have been made in the *personnel* of the company and business methods adopted, the capacity of the mines is being greatly increased and an irrigating canal is being built. Much of the property that has

in the past been a drain on the resources of the company, has been disposed of and the finances are now in such a condition that not only is the interest on the companies bonds assured, but it is rumored that within a year or two the stock may receive a dividend.

The Amador stocks continue to sell for the same prices they have brought during the past few weeks.

Plymouth Consolidated was bought frequently, and sales were made at from $8@$8 63.

Bodie was dealt in only on Saturday, when it sold at $1 75. Standard declined from $1.10@$1.

Quicksilver Common brought from $6@6.50.

Hector, which is rarely dealt in, sold at from 15@20c.

The price of Mutual remains at $1.45.

There is no change to note in the price of Rappahannock, which still remains at 7c.

Little is doing in the Black Hills stocks, Deadwood Terra is seldom quoted, and this week shows only one transaction at $1.40. Homestake at $9 50. Caledonia has again declared its regular monthly dividend and was steady at from $3 to $3.10.

United Copper is still selling at from $1.05 to $1.15.

El Cristo is apparently for the present withdrawn from the market; it was dealt in at the beginning of the week at from $1.35 to $1.40 and to-day sold at $1.35.

Boston. July 11.

[From our Special Correspondent.]

There is not much to encourage holders of copper stocks in the present condition of the market, and the future outlook is not of a character to inspire confidence in an advance in prices; on the contrary, it would seem that a lower level will be reached before any considerable reaction sets in. The market early in the week showed considerable strength, with Calumet & Hecla up $2 to $208, which has been fairly maintained. Boston & Montana was firm at $36, but later on it weakened, and sold down to $33, recovering to $35, and closing at $34¾.

Quincy sold down to $49, with later sales at $50.

Franklin, Atlantic, and Osceola dull, but quite steady at $9, the latter, however, was a little weak and sold at $8½@$8¾. There is a report that the ore is showing better in the Osceola, which may have its influence on the price of the stock later on.

Tamarack declined from $103½ to $95, and rallied again to $98, talk of a reduced dividend being the cause of the decline.

Butte declined from $24 to $22 on sales of small lots.

Allouez sold at 90c. for 30 shares only. National at $1. Pewabic, $2. Santa Fé has had a hard week, and large lots of stock have been thrown on the market. It opened at 60c., and sold down to 40c. recovering to 45c. It is reported that an issue of bonds on the property is in contemplation, which may account for the desire to sell the stock

Bonanza sympathized with Santa Fé, and declined from 80c. to 50c. on very small sales.

The silver stocks have ruled dull without material change in prices. Catalpa sold at 12c., and Dunkin ex divided at $1.05.

3 P. M.— At the afternoon call Calumet & Hecla sold at $207, Butte & Montana, $34@$34¼, Allouez at 70c, Huron and National at 62½c, Bonanza at 65c. and Santa Fe advanced to 50c. on sales of 4,000 shares.

San Francisco. July 12.

The following quotations were received from San Francisco to-day by the New York Consolidated Stock and Petroleum Exchange: Alta. $1,25; Belle Isle, 30c.; Bodie, $1.10; Con. Cal. & Va., $7.50; Challar, $1.35; Crown Point, $2; Eureka, $1; Gould & Curry, $2; Hale & Norcross, $3; Mexican, $3; Mono. 75c.; Navajo, 45c.; N. Belle Isle, $1.45; Nevada Queen, $1.70; Ophir, $4.60; Potosi, $2.50; Savage, $1.80; Sierra Nevada, $2.35; Union, $2.95; Utah, 75c.; Yellow Jacket, $2.90.

Trust Stocks.

There are five trusts, whose certificates are registered at the New York Stock Exchange, the par value of whose stock represents an aggregate of $211,983,200. It has always been something of a mystery as to what was the capitalization of the trusts, the certificates of which are dealt in among the unlisted securities on the New York Stock Exchange. The Exchange itself did not know. Frequent inquiries were made, and the question provoked much discussion. The Exchange finally sent to the registry offices of the different trusts, and on the 11th inst. the officers of the Exchange were able to tell the public something about them. The companies furnished the following figures:

Lead Trust, capitalized for	$83,018,800
Cotton Oil Trust, capitalized for	42.185,200
Sugar Trust, capitalized for	49,856,500
American Cattle Trust, capitalized for	13,396,100
Distillers and Cattle Feeders' Trust, capitalized for	30,726,600
Total capitalization	$219,183,200

This amount represents 2,191,832 trust certificates outstanding.

That the outstanding Lead Trust stock exceeded $83,000,000, instead of about $60,000,000, as had been the popular impression in the street, was a cause of disturbance in the Stock Exchange during the past week.

The investing public should learn to appreciate the unstable foundation on which these Trust "securities" rest, and the collapse which is certain to come to all of them. They are good stocks to leave alone.

PIPE LINE CERTIFICATES.

[Special report by WATSON & GIBSON.]

There have been no interesting developments during the week in the oil market, except that it be that the monthly report for receipts and deliveries of June show a reduction in stocks 686,000 barrels.

Since there was only about nine and a half million barrels of oil in shape for good delivery, and five exchanges are trading in them, it would not require much buying to materially advance the price, and it will not be long hence until the stock of oil will be so small as to compel higher prices; unless the Standard should announce that Ohio oil is fully equal to Pennsylvania oil as an illuminant. Our exports during the last fiscal year were six per cent higher than for the preceding year and at the present moment there is a large demand for oil for export.

NEW YORK EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
July 6.....	90¾	90⅞	90¼	90⅝	36,000
8.....	90½	91⅛	90¼	90¾	254,000
9.....	90¾	91⅛	90¾	90¾	127,000
10.....	91	92⅛	91	92¼	247,000
11.....	92¼	92¾	92⅛	92⅛	145,000
12.....	92⅛	92¾	91¾	91¾	116,000
Total sales in barrels					925,000

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
July 6.....	91¼	91¼	91	91	190,000
8.....	91	91⅜	90⅜	91¼	248,000
9.....	91⅛	91⅜	91	91⅛	201,000
10.....	91⅛	92¾	91⅛	92	369,000
11.....	92¼	92¾	92¼	92⅝	210,000
12.....	92½	92¾	91⅝	91¾	141,000
Total sales in barrels					1,359,000

COAL TRADE REVIEW.

NEW YORK, Friday Evening, July 12.

Statistics.

PRODUCTION OF ANTHRACITE COAL for week ended July 6th, and year from January 1st.

	1889. Week.	1889. Year.	1888. Year.
Tons of 2,240 lbs.			
P. & Read. R.R. Co.	125,991	3,046,932	2,761,985
Cent. R.R. of N. J.	107,143	2,764,510	2,479,798
L. V. R.R. Co.	130,439	3,597,598	2,838,509
D., L. & W. R.R. Co.	116,949	2,209,929	3,169,767
D. & H. Canal Co.	63,037	1,843,963	2,101,929
Penna. R.R.	49,529	1,639 634	2,222,573
Penna. Coal Co.	31,260	544,903	772,394
Penna. Canal Co.	10,000	172,862	180,540
N. Y., L. E. & W.	25,000	570,628	463,976
Total	659,348	16,390,959	16,991,471
Decrease		600,512	

The above table does not include the amount of coal consumed and sold at the mines, which is about six per cent of the whole production.

Production for corresponding period:

1884	14,694,861	1886	15,233,098
1885	13,826,292	1887	17,092,604

PRODUCTION OF BITUMINOUS COAL for week ended July 6th, and year from January 1st:

EASTERN AND NORTHERN SHIPMENTS.

	1889. Week.	1889. Year.	1888. Year.
Tons of 2,240 lbs.			
Phila. & Erie R.R.	2,279	33,117	29,474
Cumberland, Md.	60,000	1,499,732	1,780,621
Barclay, Pa.	3,500	57,003	94,067
Broad Top, Pa.		162,370	186,342
Clearfield, Pa.	53,568	1,474,160	1,727,732
Allegheny, Pa.	2,954	408,731	408,858
Beach Creek, Pa.	18,588	612,125	793,400
Pocahontas Flat Top.	15,216	770,746	730,159
Kanawha, W. Va.	*38,100	782,335	787,388
Total	194,205	5,800,379	6,538,041

*Week ending June 30th.

WESTERN SHIPMENTS.

Pittsburg, Pa	11,966	291,992	369,914
Westmoreland, Pa.	24,402	681,265	801,560
Monongahela, Pa.	10,880	150,387	189,765
Total	47,248	1,123,644	1,351,239
Grand total	241,453	6,924,023	7,889,280

PRODUCTION OF COKE on line of Pennsylvania R. R. for week ending July 6th and year from January 1st, in tons of 2,000 lbs.: Week, 76,699 tons; year, 2,255,317 tons; to corresponding date in 1888, 1,988,277.

Anthracite.

The anthracite trade is very dull; more so, in fact, than those in the business had expected. It is still hoped that next month the market will revive and will take a large production, and it is certain that from September to the end of the year the output will be very large. Prices by the companies are, as heretofore, quoted, and there is apparently no cutting, but individual operators still sell at from $4 to $4.15 for stove coal and other sizes in proportion. During the week contracts were make with the Brooklyn Water Works for the supply of about 30,000 tons of coal, of which 25,000 is broken and 5,000 tons egg. The following bids were considered: Reading Coal and Iron Company, $4 05; Stickney & Conyngham, $4.05; F. A. Potts & Co., $4.10; Delaware & Hudson Canal Company, $4.15; Lehigh & Wilkesbarre Coal Co., for Wilkes-barre coal, $4.25, and for Plymouth coal, $4.51. The contract was given to the Lehigh & Wilkesbarre Company for Plymouth coal, or the highest bid obtained the contract. The explanation given for this is that the Water-Works have tested and have found to their own satisfaction that one ton of this coal will pump as much water as 1¼ tons of any of the other coals offered. A good deal, of course, would depend on the way the tests were made, but this is the reason given for the marked preference for this coal, though every one admits that Wilkesbarre and especially Plymouth coal is of excellent quality. The supply of anthracite is now fully resumed and stocks, if anything, are increasing. The following are the quotations for free burning coal, f.o.b., New York shipping ports: Broken coal, $3.90; egg and chestnut, $4.15, and stove, $4.40 per ton.

Bituminous.

There is a steady supply and a better demand for bituminous coal. The latter is perhaps in part due to the strike which has broken out on the Pennsylvania Railroad, on the Mountain Division, and also in the Clearfield, with the exception of the Berwind-White Coal Mining Company's mines, where the men are still at work. This trouble has stimulated a demand, and prices have stiffened somewhat, so that circular rates are pretty generally obtained. We continue to quote them as $2.50@$2.60 at Baltimore, and in New York $3 40@$3.50 alongside.

A press dispatch dated Newburg, July 11, says: The Ontario & Western Railroad Company is reported to have purchased a long stretch of dock property at Cornwall, where they will establish a great coal depot. Coal will be received from the mines and shipped to points on the river and canal by boat. By the building of new roads the Ontario & Western is now in connection with the Pennsylvania coal fields.

Boston.

[From our Special Correspondent.]

The Boston coal market is fairly active for the season, although that is not saying much for the trade. There must be a vacation breathing spell, and it has begun now. The advance hinders business to some extent, but trade would be dull anyway, and little or nothing is lost by the shrewd "marking up of the goods." Shippers all report more coal at tidewater, though stocks are not by any means burdensome. There is no detention, however, on domestic sizes. Full May circular is not yet maintained. Individual operators have considerable coal which they are offering at concessions that are fairly attractive. The companies have a stock of old orders to keep them comfortably busy, and are not disposed to be very strict with buyers who have not yet found vessels at reasonable freights.

The bituminous situation is unchanged. There is a fair transient trade for cargo lots, if I may so term it, but not much is being done, and trade is not being catered for very actively, as nearly every one is rushed to ship orders now on the books. One large shipper tells me he is 50,000 tons behind his last year's record at this time and that he never had so much coal to ship as now. He has ceased waiting for freight to go off. The pool price of $2.60 f. o. b. is not very badly cut.

Freights are firm, and though perhaps not quotably higher are tending upwards.

Retail trade is moderate. An advance is expected very shortly, possibly at to-morrow's meeting of the Exchange.

Buffalo. July 11.

[From our Special Correspondent.]

The advance in anthracite coal has not been conducive to the increase of business. Family orders since the first have been small, and as there are no indications or likelihood of a decline in prices, it is apparent that consumers have accepted the situation with stoical indifference, and will order when they are obliged and not before, having little or nothing to gain by parting with their currency until the fuel is wanted for consumption. Stocks are large and ample, as the Lake movement continues light as compared with a year since.

In bituminous coal a fair trade is doing for manufacturing and steamboat purposes. No changes have been made in quotations, which, although noted as nominal, are pretty near the selling prices. There is some talk of a reduction in railroad freights from the mines before long.

Cokes quiet and unchanged.

Our friend Mr. A. J. Hoole has returned to our city, and is now connected with the Erie Railroad as coal agent and manager of the docks and trestles.

The Lehigh ore-dock at this port is a complete wreck from overloading. The ground was of made earth, and having been weakened by the wash from propellers, the big heaps of ore caused the dock to slide on Saturday last, carrying away the piles for nearly fifty feet. Its present appearance is suggestive of a small earthquake.

The cost of lighting our city streets with gas and electricity last month figured up to the total of $21,801.47; of this amount only $6,068.37 was for gas.

The gas wells at Lang's Brewery, in this city, are a great success. Four boilers are run with the supply, and there is probably sufficient gas to run the five in use. This "find" prevents the necessity of purchasing from 8,000 to 10,000 tons of coal yearly.

The Superintendent of Public Works has advertised for bids for lengthening six locks on the Erie Canal and two locks on the Oswego Canal, the work to be completed by April 20, 1890.

Lake freighting here of coal light for many days at unchanged quotations. The shipments hence from July 4th to 10th, both days inclusive, aggregating only 56,420 net tons, namely, 21,190 to Chicago, 14,150 to Milwaukee, 2,630 to Superior, 4,130 to Gladstone, 2,850 to Marquette, 450 to Au Sable, 450 to Detroit, 240 to Fort Huron, 1,030 to Racine, 500 to Ste. Marie, 5,080 to Green Bay, 1,180 to Kenosha, 450 to Bay City, 240 to Amherstberg and 50 to Duncan City. The rates of freight were 50c. to Chicago, Milwaukee, Green Bay and Gladstone; 55c. to Racine; 40c. to Bay City, Duluth, Saginaw and Fort Huron; 25c. to Detroit and Amherstberg; 45c. to Marquette; 60c. to

Kenosha; and Ashland and Sault Ste. Marie on contract.

Shipments of coal by canal for first week in July, none; receipts, 2,425 net tons. Freights were 2 loads to Ilion at 60c., and 1 load to Syracuse at 45c. per net ton, free on and off.

Pittsburg July 11.

[From our Special Correspondent.]

Coal.—There is no improvement in the situation, but rather the reverse; prices unchanged. The miners are on a strike, first and second pools works are closed. Third pool only railroad miners at work. Fourth pool miners working at 2 cents; miners in the other three pools refuse to mine for 2½ cents and are idle.

The nominal rates are:

PRICE OF COAL PER 100 BUSHELS = 7,600 LBS.

First pool	$4.75	Fourth pool	$3.25
Second pool	4.50	Railroad coal	5.00@6.00
Third pool	3.90		

Connellsville Coke.—The demand for coke is on the increase, and an advance in the near future is promised. The operations of the 77 coke plants in the Connellsville region for the past week shows a production that has not been equalled the present year. Output for the week, 108,972 tons, against 102,535 preceding week; increase, 6,434 tons. Total shipments, 6,127 cars; previous week, 5,847 cars; increase, 280 cars.

Quotations as follows per ton:

Furnace coke	$1.05@$1.10	Crushed	$1.50
To dealers	1.10@ 1.15	Foundries	1.25

Freight rates from the ovens to Pittsburg, 70c. per ton; to Shenango Valley, $1.35; Cleveland, $2.80; East St. Louis, $3.50; Chicago, $2.75.

FREIGHTS.

Rates on Iron.—A prominent officer of the Pennsylvania Railroad Company is reported to have said that on and after July 15 the rates on iron from the seaboard to the West will be put on the same basis as now charged from the West to the East. At present the rate to the West for less than a car-load is 30 cents per 100 weight, and for a car-load or more 25 cents, while the rate from the West to the East is 25 cents and 20 cents respectively. These low rates apply only to pig-iron and articles covered by the special iron tariff, which will expire on August 31, 1889.

The following rates per ton of 2,240 lbs. for coal charters are reported:

From Baltimore to: Bangor, 1.20@1.25; Bath, Me., 1.20; Boston, Mass., 1.15; Bridgeport, 1.05; Brooklyn, 1.00; Charleston, .75; Fall River, 1.05@1.10; Galveston, 3.25; New Bedford, 1.05; Newburyport, 1.50; New Haven, 1.05; New London, 1.05; New York, 1.00; Portland, 1.15; Portsmouth, N. H., 1.20@1.25; Providence, 1.05; Quincy Point, 1.15@1.20; Richmond, Va., .70; Salem, Mass., 1.15; Savannah, 1.10; Somerset, 1.05; Williamsburg, N. Y., 1.00; Wilmington, N. C., 1.10.

From Philadelphia to: Annapolis, 70; Bangor, Me., 1.15*; Boston, 1.10@1.15*; Charlestown, 1.15; Chelsea, 1.20*; East Cambridge, 1.15*; Fall River, .80@.90*; Georgetown, D. C., .85†; Gloucester, 1.10*; Lynn, 1.25@1.35*; Milton, 1.25*; New Bedford, .80@.90; Newburyport, 1.25*; New York, .90†; Norfolk, Va., .65; Portland, 1.10@1.15*; Portsmouth, N. H., 1.15*; Providence, .80@.90*; Richmond, Va., .60; Salem, 1.20*; Savannah, 1.15*; Washington, .85.†

* And discharging. † Alongside.

METAL MARKET.

NEW YORK, Friday Evening, July 12, 1889.

Prices of silver per ounce troy.

July	Sterling Exch'ge.	Lond'n Pence.	N. Y. Cts.	July	Sterling Exch'ge.	Lond'n Pence.	N. Y. Cts.
6	4.87½	42 3-16	92	9	4.87½	42 3-16	92
7	*	*	*	10	4.88	42 3-16	92⅛
8	4.87½	42 3-16	92	11	4.88	42 3-16	92⅛
				12	4.88	42 3-16	92⅛

* Sunday.

Silver market has held firm this week, with an advance of $\frac{1}{16}$d. per rupee on allotment of Indian Council bills.

The supply of silver in this market from the West has been somewhat limited the past week, and shipments to London continue small.

United States Assay Office at New York reports total receipts of silver for the week 40,000 ounces.

Domestic and Foreign Coin.

The following are the latest market quotations for American and other coin:

	Bid.	Asked.
Trade dollars	$ .72	$ —
Mexican dollars	.73½	.74
Peruvian soles and Chilian pesos	.73	.73½
English silver	4.85	4.89
Five francs	.94	.95
Victoria sovereigns	4.87	4.90
Twenty francs	3.92	3.95
Twenty marks	4.75	4.80
Spanish doubloons	15.55	15.75
Spanish 25 pesetas	4.80	4.85
Mexican doubloons	15.55	15.70
Mexican 20 pesos	19.50	19.65
Ten guilders	3.96	4.00

Copper.—The rumors which were in circulation a week ago about an impending rupture in the existing relations between the general body of Lake copper producers have proved to be without practical effect on prices.

It is said that the Tamarack Company has expressed repentance, and if it should actually make just amends the other companies will probably re-establish the former understanding. At present most of the companies are free to produce and sell without restraint, but none of them is willing to take the first step in breaking the price below 12 cents, so that this price is likely to be maintained. There is no doubt, however, that the impression made by the evasion of the understanding by the Tamarack has lessened the confidence felt by the other companies in the stability of the arrangement. Speaking generally, the market here remains without any special feature worthy of reporting, but the feeling on the part of consumers has undoubtedly undergone a marked change, and their confidence in the maintenance of present values for any length of time has been greatly diminished. This uncertainty as to the course of future values has had some effect on the demand for the metal, and the orders from consumers are said to have fallen off lately to some extent. The present quotations are as follows: Lake copper, 12c.; Casting copper, 10⅝@10¾c.

The London market has also lost some of the firmness which has lately characterized it at the lower level of values recently reached. This weakening tendency is not so apparent in the prices of Chili Bars and G. M. B.'s as in the quotations for fine copper. Our last cable advices from London report the closing quotations for Chili Bars and G. M. B.'s at £41 spot and £40 10s. three months' futures, against £41 12s. 6d. spot and £41 2s. 6d., three months, at the end of last week. The other descriptions, from Tough to Lake Superior ingot copper, range between £45 10s. and £52. Sheet copper is held at 28@32c., according to size.

The exports of copper from New York during the past week were as follows:

To Havre—	Copper.	Lbs.	
By S. S. La Gascogne	320 casks	400,000	$48,000
To Liverpool—	Copper Matte.		
By S. S. The Queen	4,173 bags	464,022	20,700

Tin.—The market here has again been subject to the same kind of fluctuations as for some weeks past, following the somewhat erratic course of the London market. Closing last week at £89 7s. 6d. to £89 10s. spot, and £89 7s. 6d. to £90 three months; the same price was maintained on Monday, but on Tuesday the quotations dropped to £88 5s. to £88 7s. 6d. spot, and £88 15s. to £89 three months; on Wednesday, however, there was a rise of about 5s. a ton, and on Thursday a further gain of about the same amount bringing the quotations up to £88 15s. to £88 17s. 6d. spot, and £89 12s. 6d. to £89 15s. three months. On Friday the market again opened at a decline of 5s., and the latest closing prices received by cable are: spot, £88 12s. 6d.; futures, £89 5s. The consumptive demand in this market has improved somewhat lately, and the comparatively low prices of the metal on this side (being below the cost of importation) have evidently encouraged more buying. Our closing quotations to-day are: spot, 19·75; July, 19·60; August, 19·85; September, 19 90.

Lead.—The weakening tendency of lead prices has become more pronounced during the past week, and there appears to be an entire absence of buyers at present, consumers seeming to be all well supplied for some weeks anead. The little business done during the past few days has principally been in second-hand lots, the sellers being chiefly consumers who bought rather more metal than they needed a short time ago, fearing that the expected decision of the Treasury on the question of the duty on imported silver-lead ore might lead to a sharp advance in values, and these buyers are now selling part of their holdings out again. On the other hand the western smelters, being well booked with orders, are not selling now at the lower quotations. We quote to-day's closing prices: spot, 3·95; July, 3·95; Aug., 3 95 Closing quotations are as follows: Domestic, common, spot, 3·95c., Foreign, 4·87½c., Sheet, per pound, 6¾c.; Pipe, per pound, 6c.; Tin-lined pipe, per pound, 15c.; Shot, per 25-pound bag, 1·25c.; Spanish lead, London, £12 7s. 6d.

The Chicago Market.—Messrs. Everett & Post telegraph us to-day as follows: Market is slightly weaker. Desilverized is offered in a limited way at 3 85c. Sales for the week aggregate 300 tons at 3·87½@3·85c. Trade is very quiet.

The St. Louis Market.—Messrs. John Wahl & Co. telegraph us as follows: Business during the week has been very quiet, and sales have been of a retail character. Prices are slightly lower, owing to unfavorable sea-board advices. Common and refined offered at the close at 3·8c.

Spelter remains quiet in line with some parcels in second hands offered on the market at 5c., whilst the producers hold the metal very firm for prices on the parity of 5·10@5·20 New York, and even at these figures the quantity available for early shipment is very small. Foreign is quoted at 5·80c. per lb. and £19 5s. per ton. American sheet zinc, per lb., 6¼c.

Antimony.—This metal continues very strong and in good demand at 15⅜-½ for Hallett's and 16¼-½ for Cookson's. English makers have again advanced their quotations to £65 10s. for Hallett's.

Nickel.—The scarcity of available supplies has caused an advance in the prices of both foreign and domestic nickel. For the former we quote 65@70c. per lb, and for the latter, 60@65c.

Quicksilver.—The market has been slightly easier at 63@65c. Latest London quotations are £8 15s.@ £9.

IRON MARKET REVIEW.

FRIDAY EVENING, July 12.

The shipments of iron ore from the Lake Superior mines for the past week have beaten all previous records for a single week, footing up 275,595 gross tons, an increase of 95,183 tons over the same week in 1888. The shipments for the season aggregated 2,350,796 tons, an increase over the corresponding date last year of 1,156,374 tons. If the present rate of output is maintained, the mines will put 6,000,000 tons on the market this season. This does not look like any scarcity of ore, and it indicates a very large production of pig iron.

Pig Iron.—The market has been generally steady and unchanged during the week. There appears to be little, if any, surplus iron offering; certainly there is none pressing on the market, and quotations are firm at last week's figures. The demand continues good, and for the present, at least, consumption and production appear to be nearly equal. Some of the furnaces seem reluctant to contract ahead for deliveries later than September, but until the probable course of the market for the latter half of the year is more easily discernible, consumers need have little anxiety to secure contracts. In the way of actual transactions, there is little to report. About 5,000 tons of Southern iron have been sold by various houses. Quotations are very uniform. Northern brands are held at from $17 to $18 for No. 1, the latter figure being rather exceptional; No. 2, $16@$16.50; Gray Forge, $15 50. Southern brands are quoted as follows: No. 1. $16.50@$17; No. 2, $15.50@$16; No. 3, $15@$15.25, and $14.50 for Gray Forge.

Scotch Pig.—A few hundred tons have been sold at full prices, the foreign market being very firm We continue to quote as follows: Dalmellington, $19.50; Eglinton, $19; Langloan, $21; Summerlee, $21.50; Shotts, $21; Coltness, $21.50. The following quotations were received by cable to-day to the Metal Exchange: Scotch Warrants, 43s. 10d.; Coltness, at Glasgow, 54s.; Langloan, at Glasgow, 54s.; Summerlee, at Glasgow, 54s.; Gartsherrie, at Glasgow, 52s.; Glengarnock, at Ardrossan, 51s. 9d.; Dalmellington, at Ardrossan, 45s. 6d.; Eglinton, at Ardrossan, 44s.

Writing us from Manchester on the 29 ult., Messrs. S. W. Royse & Co. say: "After a gradual fall in values of pig iron at Glasgow and Middlesbro' during the first three weeks of this month, matters have taken a turn and prices advanced. Inquiries are numerous for forward delivery, but makers are quite disinclined to operate. With the advance in miners' wages, and consequent increase in value of raw materials, the cost of production of pig iron must shortly be considerably enhanced. Shipments from Middlesbro' during the month are only moderate, being returned as 61,726 tons up to the 24th inst., as against 59,031 tons for corresponding period of last year."

Spiegeleisen.—Transactions have been light and prices stationary at $28@$28.50 for either English or German makes, 20 per cent. Ferro-manganese, 80 per cent., is quoted at $59@$60, being a little lower, with nothing doing.

Billets, Slabs and Rods.—For the imported articles, prices are almost entirely nominal. Foreign wire rods are held at $43. American steel nail slabs can be bought at $29.50.

Steel Rails.—It is believed that with possibly one or two exceptions all of the mills are well sold up and in many quarters it is impossible to obtain early deliveries. The demand during the week has been better even than usual. The sale of 6,000 tons to which we referred last week as for Southern delivery went to the East & West Railroad, of Alabama. This, together with the fastenings, etc., has been one of the largest of recent sales. For about a month there has been an inquiry in the market for some 23,000 tons for a road just south of Baltimore. I is reported that this has been finally placed, but we are unable to learn with whom. The quotation of $28 per ton is continued.

Structural Iron and Steel.—While the market for all kinds of finished iron is temporarily quiet on account of the stoppages at a number of the mills, the demand continues good. The requirements of consumers are still large and in the matter of prices the advantage may be said to be in sellers' favor. We quote as follows, at mill: Bridge plate, 2·1c.; angles, 2@2·1c.; Tees, 2·5@2·6c.; steel angles, 2·5c.; beams and channels, on wharf, 2·8c.

Steel Plates are held as follows on wharf: Tank and Ship, 2·25; Shell, 2·4@2·5; Flange, 2·8; Fire-Box, 3·50@4.

Iron Plates are quoted as follows on wharf: Common tank, 2·25c.; refined, 2·3@2·4c; shell, 2·4@2·5c.; flange, 3·5@3·7c.; extra flange, 3¾@4.

Bar Iron.—At mill common is quoted at 1 6@1·7c, and refined at 1·75@1·9c. Deliveries from store are quoted as follows: Common, 1·9c. base; Refined, 2c. base; "Ulster," 3c. base; "Norway," 5c. shapes, and Norway nail rods, 5c.

Merchant Steel.—Sales have not been of little importance and prices are fairly steady. We quote as follows: Best English tool steel, 15c. net; American tool steel, 7½@10c.; special grades, 13@20c.; crucible machinery steel, 5c.; crucible spring, 3¾c.; Bessemer machinery, 2¼@2½c.; Bessemer spring, 2¼@2½c.

Pipes and Tubes.—The demand is steady and of fair proportions. Cast-iron pipe is quoted at works, according to size, from $25.50 to $30. Wrought-iron pipe prices are subject to the following discounts: Butt-wheeled, plain and tarred, 55 per cent discount; galvanized, 45 per cent discount; lap-welded, plain and tarred, 65 per cent discount; galvanized, 55 per cent discount. In accordance with the recently adopted schedule, a discount of 60 per cent is allowed on boiler tubes.

Rail Fastenings.—A sale of about 400 tons of fastenings to the East & West Railroad of Alabama has been consummated. The prices, of course, covered the cost of delivery in the South, but we understand that they were based on about the following prices: Spikes, 1·95c.; angle fish-bars, 1·75@1·85c.; bolts and sq. nuts, 2·70@2·75c.; bolts and hex. nuts, 2·80@3c.

Old Material.—No. 1 wrought scrap is worth about $21, and cast scrap, $14.50@$15 No sales of either are reported. Old rails have now been sold at $23. A lot of 500 tons was sold this week at this figure, and we are also informed that the offer of 1,000 tons to be shipped from a European port, which we reported last week as under advisement, has finally been accepted. The offering of old rails is light, and prices are firm.

Cleveland. July 11.

[From our Special Correspondent.]

Inquiries for ore with correspouding sales have continued steady during the past two weeks, at unchanged prices. Furnacemen acknowledge that the best and standard brands of ore are pretty well sold up. Odd lots of ores with doubtful reputation are quoted from 25c. to 50c. below the market, but consumers are somewhat shy of these brands, preferring to pay a higher price for well-known ores which will yield according to representations. Lake freights remain unchanged.

Quotations remain the same.

SPECULAR AND MAGNETIC ORES.

Bessemer,	66 to 69 per cent		$5.50@$6.25
"	60 to 64	"	4.56@ 5.50
Non- "	66 to 69	"	5.00@ 5.25
" "	62 to 65	"	4.25@ 4.75
" "	57 to 50	"	3.75@ 4.00

SOFT HEMAT TES, DRIED AT 212 .

Bessemer,	62 to 65 per cent		$4.50@$5.00
"	59 to 61	"	4.25@ 4.50
Non- "	57 to 62	"	3.50@ 4.25

Above prices are delivered at docks at Lake Erie ports.

Philadelphia. July 12.

[From our Special Correspondent.]

Pig Iron.—Firmness characterizes the entire market. This week's business does not foot up quite as well, but there is still plenty iron selling. What helps to strengthen this market is the fact that very little Southern iron is offering or is sold here. The Southern furnace people, according to our advices, are indifferent about selling their output after September 1st. Buyers have been quite diligent during the past few days, and there are very few who are in need of iron for 30 days and many need not buy for nearly 60 days. Makers are not in the least disposed to yield, notwithstanding the increase in the output of both antbracite and bituminous furnaces. Forge iron is selling quietly at $15@$15.50, No. 2 at $16@$16.50, and No. 1 at $17 to $18, there being less iron than usual selling at inside figures.

Scotch Iron —A few lots have changed hands at full prices.

Blooms.—The oversold condition of most bloomeries has given the market the appearance of unusual firmness, as makers are nominally quoting higher, though square offers would be taken at $29 for small lots of nail s abs, $30.50 for tank slabs, $33 for shell slabs, and $41.50 for anthracite. Charcoal blooms are strong at $52@$54.

Muck Bars. –The market retains all its strength under a steady demand of small lots. The larger buyers are out of the market. A fair quotation delivered is $28.50, but several makers are asking $29.

Bar Iron.—Nearly all makers here and in the interior are asking a little more than June prices, but not all of them are getting it. The range of prices from medium to refined is 1·70@1·85.

Skelp.—Ground skelp ranges from 1·70@1·80c., and sheared from 1 95@2c. There is a good deal of talk about business in the near future, but actual business is light.

Nails.—Interior makers are getting rid of car-load lots at 1·85c., which is a good price considering the large offerings of good nails. So far this year 4,714 two-story dwellings have been erected or projected against 3 250 last year to date, and 1,427 three-story dwellings against 1,007. The total outlay for six months foots up $16,482,451.

Wrought-Iron Pipe.—Demand for pipes and tubes is strong, and mills are filling up with business faster than old orders are being worked off.

Sheet Iron.—The card rates are being willingly paid. The anxiety is now to obtain prompt deliveries.

Plate Iron.—Some manufacturers have ventured to name a slight advance on buyers who needed prompt deliveries, and in several ascertained instances the advance, though slight, was paid. Quotations do not mean much this week, as they show a wide range, viz.: 2@2·20c. for plate and tank; shell, 2·40@2·60c.; flange, 3·20@3·30c.; fire-box, 3·75@4c.

Structural Iron.—Bridge builders are now hurrying their orders in, and the mills are crowded for July and most of August. Considerable September work is in. Quotations are 2·10c., for bridge plate, angles 2·10 @2·20c.; tees, 2·60c.; beams, 2·8c.

Steel Rails.—The multitude of inquiries, big and little, are helping to keep quotations, even on large, full lots, quite strong. The merchant steel requirements are increasing. Quotations on rails, $28.

Old Rails.—The yardmen believe that prices will harden as the season progresses, and most of them are refusing to sell below quoted rates, which are $23.

Scrap Choice, $22; car lots, $21@$21.50. No particular movement in other kinds.

Pittsburg. July 11.

[From our Special Correspondent.]

Raw Iron.—Trade during the week has been fairly active. Certain descriptions of iron find ready purchasers at current rates, while other sales were made at an advance on last week's figures. We hear of several round lots under negotiation that will be consummated in the near future. A sale of 1,000 tons gray forge was made at a valley furnace at $13.75 cash, equal to $14.40, Pittsburg delivery. This is 50 cents per ton above what the same description of iron could be purchased for two weeks ago. Several thousand tons were sold in the Valley at $13.60@$13.75 at furnace, cash. Nevertheless, the market has increased in strength all round; the principal difficulty is to meet the demand for early deliveries, while, as regards those of later date, the difficulty is to know what prices to quote. There is not the slightest doubt now in regard to the character of the market, everything on the list being firm with limited stocks to operate with. The market is generally much better. Steel billets and nail slabs have advanced fully $1.00@1.25 per ton since July 1st, and in heavy demand at the advance. Muck bar is 50 cents per ton higher. Bessemer iron has advanced 50 cents per ton. Mill iron, 30 cents per ton higher. This certainly looks healthy for fall trade. The fact is stocks in first hands are not large, consumption is daily increasing and iron must be obtained in order to keep the works running. Old rails are advancing. The same may be said of scrap material. The fact is the general outlook is the best of the year.

Prices.

Coke or Bituminous Pig—		Muck-Bar.....	26.75@27.00
Foundry No. 1..	$16.25@16.50	Steel Blooms..	.....@28.00
Foundry No. 2..	15.25@15.50	Steel Slabs.....	.....@28.50
Gray F. No. 3..	14.00@14.25	Steel Cr'p Ends	18.00@18.00
" No. 4..	13.75@13.85	Steel Bl. Ends..	18.25
White.....	13.50@.....	Ferro Man., 80%.	.....@61.00
Mottled.....	13.50@.....	Steel Billets..	27.75@28.00
Silvery.....	16.00@18.50	Old Iron Rails..	22.00@22.25
Bessemer	16.00@16.35	Old Steel Rails.	17.50@18.00
Low Phos.....	20.50@.....	No. 1 W. Scrap.	18.50@.....
Charcoal Pig—		No. 2 W. Scrap.	17.50@.....
Foundry No. 1..	23.50@24.50	Steel Rails.....	27.50@28.50
Foundry No. 2..	22.00@23.50	" light sec..	27.50@31.50
Cold-Blast.....	25.00@28.00	Bar Iron, nom..	1.65@ 1.70
Warm-Blast....	24.00@25.00	Iron Nails.....	1.85@ 1.90
10 + 12% Speigel	28.25@28.75	Steel Nails.....	1.85@ 1.90
20% Speigel.....	31.50	Wire Rails.....	2.15@ 2.20

Sales.

Coal and Coke Smelted Lake Ore.

4,000 Tons Bessemer, July and August	$16.35 cash.
1,500 Tons Bessemer	16.00 cash.
1,000 Tons Bessemer	16.70 cash.
1,000 Tons Gray Forge	14.00 cash.
1,000 Tons No. 1 Mill	14.40 cash.
1,050 Tons Gray Forge	14.15 cash.
1,000 Tons Gray Forge	14.20 cash.
750 Tons Bessemer	16.00 cash.
500 Tons Gray Forge	14.00 cash.
200 Tons Bessemer	16.00 cash.

Coke, Native Ore.

125 Tons Silvery	15.50 cash.
100 Tons No. 1 Foundry	16.00 4 mo.
100 Tons No. 2 Foundry	15.00 cash.
75 Tons Mottled and White	15.50 cash.
52 Tons No. 2 Foundry	15.75 4 mo.

Muck Bar.

1,000 Tons Neutral, spot	27.00 cash.
1,000 Tons Neutral, spot	27.00 cash.
1,000 Tons Neutral, spot	27.00 cash.
750 Tons Neutral, delivered East	28.75 cash
1,200 Tons Neutral, July and August	27.00 cash.

Steel Slabs and Billets.

1,000 Tons Billets and Slabs	28.50 cash.
500 Tons Billets	28.00 cash.
250 Tons Billets	28.00 cash.

Bloom Ends.

750 Tons Bloom Ends	18.25 cash.
700 Tons Bloom Ends	18.10 cash.

Steel Wire Rods.

750 Tons American Fires	40.00 cash.
300 Tons American Fires	40.50 cash.

Ferro-Manganese.

200 Tons 80 per cent	60.75 cash.
50 Tons 80 per cent	61.00 cash.

Old Iron Rails.

500 Tons American Ts	22.25 cash.

Skelp Iron.

1,200 Tons Sheared, per 100 lbs	0.92½ 4 mo.
800 Tons Wide Grooved, per 100 lbs	1.70 4 mo.
600 Tons Narrow Grooved, per 100 lbs	1.65 4 mo.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, July 12.

Heavy Chemicals.—The market has undergone a decided improvement during the week. In consequence of the curtailment of shipments from primary points, spot supplies have become very light, and local holders have uniformly raised their asking prices.

Caustic soda is held at $2 22½@$2.25 for the higher tests, 70 and 74 per cent.

Bleaching powder has also stiffened in sympathy with the rest of the market, but, on account of the demand being light, the improvement in this article has not been so marked as it has in caustic soda. For round lots of bleach for shipment $1.52½ per cwt. is asked. Quantities from store may be obtained at $1.70 and small lots at $1.87½.

Soda ash is also firmer. Caustic ash, although in light demand, is quoted at $1.27½, and carbonated ash is still higher at $1.30. There is considerable inquiry from the glass makers for future contracts, and consumers in other industries take about all the spot supply that is offered.

Salt cake has also advanced. Latest quotations are 62½@67½c.

Acids.—No pressing accumulation of stocks nothing more than the ordinary demand, and prices generally steady are the features of the New York trade in acids. Acetic is probably the weakest of any in price, and can be obtained at 1⅞c. Nitric and muriatic are held by some makers at slightly higher figures. For the former we get quotations of 4½c. for 36 degrees and for the latter 1⅛c. for 18 degrees. Sulphuric is in fair demand at from .90c. to 1c., according to quantity and seller.

Fertilizing Chemicals.—Although some business has been done in contracts for early fall delivery, the market is not generally active, and values have slightly depreciated, as is usual at this period. It is worthy of note that in several instances crude material is cheap enough to make it advisable for fertilizer manufacturers to lay in supplies for some time to come. After a canvass of the market, we present the following quotations, which, as above noted, are lower than those given last week: Azotine, $2.30; dried blood (city) low grade, $2 30 per unit; Western high grade, $2.35@$2.37½ per unit for ground material; tankage, high grade, $24@$25 per ton; low grade, $22@23 per ton, as to quality. Fish scrap, $22@$23 per ton, f.o.b. factory. Sulphate of ammonia at $3.05 @$3.10 per cwt.

Refuse bone-black, guaranteed 70 per cent phosphate $19@$20 per ton. Dissolved bone-black is 90@95c. per unit for available phosphoric acid, and acid phosphate 80c. per unit for available phosphoric acid.

Steamed bones, unground, $20: ground, $24.

Charleston rock, undried, $5.50 per ton; kiln dried, $6.50@6.65 per ton, both f.o.b. vessels at the mines. Charleston rock, ground, $11, ex-steamer at New York. Advices from Charleston this week state that the market is slightly firmer. Along with this intelligence comes the statement that two well-known Americans, ex-Senator Jas. E. Campbell, of Ohio, and Jas. B. Hughes, U. S. Consul at Birmingham, Eng., are endeavoring to induce English capitalists to buy up, so far as possible, the South Carolina phosphate beds. It is reported that options expiring September 24th have been secured on the properties and plants of the Rose and the St. Andrew's mining companies. The price to be paid is mentioned at $220,000 for the former and $160,000 for the latter.

Muriate of Potash.—Arrivals are moving freely from first hands at $1.80 per cwt. It is thought, however, that fertilizer manufacturers have contracted for somewhat larger supplies of muriate than they will be able to use during the remainder of the year, and it is therefore feared that later on the market may be weakened by resales. This, of course, can not now be positively affirmed, but is worthy of the consideration of buyers.

Double manure salts, basis 48 per cent potash, is in light demand at $1.15@$1.20 per cwt. A number of sales of high-grade manure salts, basis 90 per cent potash, are reported. We understand that all sales contracts are accompanied by the guarantee of the sellers that if the duty is removed on high-grade sulphate of potash the reduction in cost will be shared with the buyers. Without a guarantee of this nature the recent agitation of this matter would have kept buyers away until some definite determination was reached. We quote $2.30@$2 35 on a basis of 90 per cent potash.

Kainit.—One of the syndicate's sales agents states that he has sold two cargoes for August-September shipment during the week. On the spot, sales of 20 tons have been made. There are about 30 tons in store which are offered at $10.50 per ton. For shipments, quotations continue at $9.75 per ton, foreign invoice weight.

Advices from Madrid report that a large inquiry for phosphate mines has sprung up of late, particularly from Germany. Some mines in the vicinity of Navamoral, Spain, which were at one time in the hands of English proprietors, are about to be sold to a large German house.

Miscellaneous.—Nitrate of soda is suffering from an overdose of statistics. In so saying we do not mean to intimate that the causes of the present depression are not all imaginary. Recent arrivals have been large enough to indicate that the market is in a congested state, but it is a fact that the recent statements of the statistical position of the article have created in many quarters a feeling of distrust. This week we hear of quotations as low as $1.87½. The market, however, may be quoted at about $1.95.

Brimstone is steady, at last week's quotations. Best unmixed seconds command about $19.50.

Borax, both city refined and California, are now quoted at 9⅛@9¼c. Both the demand and supply are reported to be light.

Chalk.—The offering on the spot is a little larger than usual. We quote to $2.25@$2.75.

FERTILIZER MARKET OF THE UNITED KINGDOM.—Writing us from London on the 17th ult., Messrs. Couper, Millar & Co. say: Since our last business has been somewhat restricted, manufacturers holding off, as they are unwilling to believe in the advance in the price of phosphates which has been established. Within the last few days there has been more disposition to contract for next season's requirements, and the continental demand continues active, more especially for high test. The prices ruling in America for South Carolina restrict shipments to Europe, and the demand there in the immediate future is more likely to increase than diminish. Nitrate of soda is firmer, even though the season's demand is about over while sulphate of ammonia is very steady.

Mineral Phosphates.—Canadian is more appreciated on continent than in United Kingdom. For 80 per

cent 1s. ½d. ex ship London and Liverpool may be considered to-day's price, with 75 per cent at 11d. and 70 per cent 10d. per unit, all with ¼d. rise. South Carolina, 9½d. to 10d. Some of the higher tests inquired for, but not to be had except at extreme prices. The lower grades we can offer on reasonable terms. Belgian, 40 to 45 per cent and 45 to 50 per cent we are sellers of, prices according to port of discharge.

Ammoniacal materials wanted. Fish guano and ground hoofs and horns we have sold forward, but can still offer more. Dried blood does not command so much attention, prices asked being comparatively much too dear. Muriate of potash is quoted at £7 5s. on 80 per cent; kainit at 23s. 6d. in bulk, 26s. 6d. in bags, and kieserit at 17s. 3d., all f.o.b. Hamburg, subject to open river navigation. Net cash. Strassfurt weights and sampling.

Several meetings of the promoters of the proposed international salt trust have been held in this city this week. It is said that the New York State salt men are rather disinclined to enter the trust.

Manchester. June 29.

(S. W. ROYSE & CO.'s Report.)

Chemicals.—Taking into account the break caused by the Whitsuntide holidays, and the natural desire on the part of consumers to reduce stocks as the end of the half-year is close at hand, the amount of business in chemicals during the month has been satisfactory. Bleaching powder has certainly dropped steadily and has lost about 10 s. per ton during the month. The Board of Trade returns show, however, an improvement in the exports of bleaching materials during the month ending May 31st last of 366 tons or £1,883 as compared with the corresponding month of last year, and of 1,211 tons or £9,206 as compared with the month ending April 30th last. There has been a moderate demand for caustic soda, but not sufficient to maintain prices. Soda ash is in good demand, and tending towards higher figures. Soda crystals are in rather short supply, the hot weather interfering with the production, and prices are very firm. The exports of Alkali for the month ending May 31st last show a decrease of 4,966 tons or £28,277 as compared with those for the corresponding month of 1888, and of 719 tons or £2,134 as compared with those for the month of April last.

BUILDING MATERIAL MARKET.

NEW YORK, Friday Evening, July 12.

Bricks.—During the period from Wednesday of last week to Monday last, while the local exchange was closed, shippers prudently refrained from sending cargoes down from Haverstraw and up river points and consequently the accumulation of supplies when the market opened on Monday morning was not so great as was expected The actual amount offering is variously estimated, but at any rate it was worked off by Wednesday afternoon. This indicates that the demand has now assumed very fair proportions and with proper care on the part of shippers the market should remain in a satisfactory condition for some time to come. Prices have been generally steady during the week: Haverstraws command $6@$6.50 ; up-rivers, $5.50@$6; Jerseys, $4.75@$5.50, and pale, $3.25@$3.75.

Lime.—There have been a number of arrivals during the week, which have been absorbed by the current demand. Inquiries have been quite liberal, and the market at the moment appears to be in condition to take a little more lime than has heretofore been sent forward from primary points. Prices are steady and unchanged.

Cement.—This market, as we have frequently stated, is in an unsatisfactory condition. It will be remembered that at the opening of the year dealers professed a very conservative policy in regard to importations and asserted that they had been careful in not contracting ahead for more cement than could be readily disposed of. Looking back over the first six months of the year, we must now come to the conclusion that either this professed policy has not been adhered to or else the demand has proven much less than what was counted upon. Both suppositions are probably correct. Prices, however, are not so low by about fifteen cents per barrel as they were at this date in 1888. Ordinary brands of imported Portland can be bought at $2.30. Domestic Rosendale is held at about 90c.@$1. Domestic Portland is quoted at $2.15@$2.40.

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IMPORTS AND EXPORTS OF METALS AT NEW YORK JUNE 15 TO JULY 6, 1889, AND FROM JANUARY 1.

IMPORTS.

Spelter.	Week. Tons.	Year. Tons.
Amer. Metal Co		67
Downing & Co., R.F		28
Hendricks Bros		28
Lamarche's Sons, H.		6
Naylor & Co	70	275
Total	70	404
Corres. date, 1888	69	1,242

Nickel.	Lbs.	Lbs.
McCoy & Sanders		11,240
Total		11,240
Corres. date, 1888		138,166

Antimony.	Casks.	Casks.
Total		1,358
Corres. date, 1888	225	1,786

Pig Lead.	Lbs.	Lbs.
Caswell, E. A		10
Erie Dispatch		9
Foley, E		43
Henderson Bros		11
Hendricks Bros		67
Total		140
Corres. date, 1888	111	257

Tin.	Tons.	Tons.
Amer. Metal Co	85	566
Bidwell & French	150	600
Bruce & Cook		14
Carter, Hawley & Co		43
Cohn & Co., A		12
Crooks & Co. A	3	175
Daval & Son, John		21
Hendricks Bros		128
Knauth, N. & Kuhne		10
Lehmarer, S. & Co		97
Mendel & Tompkins		1
Muller, Schall & Co		917
Naumann, F		1
Naylor & Co	19	1,185
Phelps, Dodge & Co	148	1,745
Pope, J. E, Jr		225
Schmarer & Co		11
Thomsen, A. A		151
Thomsen, D		156
Townsend, J. R		135
Wheeler & Co		1
Total	405	6,233
Corres. date, 1888	383	8,265

Tin Plates.	Boxes.	Boxes.
American MetalCo		477
Brown & Co., V. H		350
Bruce & Cook	2,294	53,108
Byrne & Co., J		8,392
Central Stamp. Co	4,699	56,343
Coddington & Co	2,508	91,889
Cohen, S M		272
Cohn & Co., A	2,330	13,590
Con. Fruit Jar Co	195	981
Cort & Co., N. L	8,740	90,718
Corbier, F. & S		3,644
Crooks & Co	3,214	56,708
De Milt & Co	241	11,121
Dickerson, V. D	11,665	203,362
Downing & Co		366
Erie Dispatch		244
Fenton, D. U	291	938
Foley, E		75
G. L. N		75
Holder & Herrick		271
Iron Clad M. Co		283
Ismay, J. B		500
Lalance & G		6,207
Lazard Bros		2,356
Lombard, Ayres		3,000
Merchant & Co	1,511	11,664
Mersick & Co	493	6,509
Morewood & Co	202	7,232
Mulholland & H		767
Newell Bros		294
Payne & Son		208
Phelps, Dodge & Co	5,618	353,582
Pratt Mfg. Co	6,359	130,368
Wolff & Reesing		3,106
Sanders Bros		479
Shepherd & Co	2,341	17,528
Somers Bros	308	1,356
Taylor Co., N. & G		322
Thomsen, A. A	5,580	116,601
Warren & Co., J. M		3,534
Wheeler & Co	496	12,174
Whittemore & Co	224	19,334
Wolff & Reesing	1,391	4,497
Total	60,756	1,372,970
Corres. date, 1888	27,706	1,118,067

Pig Iron.	Tons.	Tons.
Bartlett, N. S		900
Crocker Bros	507	440
Crooks & Co		500
Drummond, McC. & Co	300	900
Henderson Bros		166
Godwin & Son, A. G		390
Irvin & Co., R		150
Martin, W. T		150
Naylor & Co		50
Page, Newall & Co		75
Perry & Ryer		125
Pierson & Co		500
Pope, Sons & Co		250
Sheldon & Co., G. W		200
Stetson & Co	100	3,750
Walbaum & Co		275
Whittemore & Co., H		50
Williamson & Co	300	2,100
Total	700	12,274
Corres. date, 1888	570	28,651

Steel Sheets, Billets, Forging, etc.	Tons.	Tons.
Abbott & Co		2,450
Ames, W. T		253
Austin & Co	30	30
Baldwin Bros. & Co		15
Belcher, H. W		95
Boker, C. F		131
Carey & Moen		118
Carter, G. F		200
Coddington & Co		24
Crenshaw, Hugh		27
Crooks & Co		292
Cortis, R. J		408
Curran, J		5
Dana & Co		11,705
Downing & Co		171
Erie Despatch		40
Galpin, S. H		497
Hugill, Chas		95
Ismay, J. B		174
Lalance, & G		106
Lazard Bros		6
Leng's Sons, J. S		114
Lublin & Estey		7
Lundberg, G		51
Mersick & Co		5
Milne & Co	55	1,612
Montgomery & Co		5
Naylor & Co		2,710
Newton & S		35
Oelrich & Co		389
Pierson & Co		323
Pilditch, F. S		75
Power, C. W		36
Prosser, Thos		496
Roebling's Sons		112
Schulze & R		13
Standard Oil Co		222
Stetson & Co		11
Strouse & Co., M		25
Temple & L		15
Wagner, W. F		373
Wallace & Co		5
Wetheral Bros		2
Whitney & W		30
Wiel Elie		44
Wiell & Co		7
Williams & W		95
Wolff, R. H		347
Total	85	24,011
Corres. date, 1888	294	17,281

Bar Iron.	Tons.	Tons.
Abbott & Co., J		1,017
Bacon & Co		330
Dana & Co	25	25
Downing & Co		519
Froment, F		10
Holt & Co., H. N		74
Jacobus, E. G		17
Lang & Co		8
Lilienberg, N		3
Lundell, C. G		160
Merchants' Dispatch		15
Milne & Co	50	467
Muller, Schall & Co		575
Naylor & Co	67	253
Ogden & W		7
Page, N. & Co	50	1,036
Plenty, John		2
Froment, F		440
Wells, F., & Co		15
Total	167	4,853
Corres. date, 1888	101	2,293

Steel and Iron Rods.	Tons.	Tons.
Abbott & Co., J	443	2,597
American S. Co	51	752
Bacon & Co		350
Boker, H		20
Bruce & Cook		20
Carey & Moen	166	699
Cooper, H. & Co		40
Crabb & Co., W		17
Dana & Co		1,915
Downing & Co		690
Durbrow, Walter	52	372
Eckstein, G. C	98	98
Fuller, D. & T		15
Galpin, S. H		1,057
Hazard Mfg. Co		20
Heyn, A	280	2,034
Hugell, Chas		27
Lilienberg, N		56
Lundberg, G		56
Lundell, C. G		246
Milne & Co		592
Montgomery & Co		36
Muller, Schall & C	22	400
Naylor & Co	233	9,651
Nichols, B. J		10
Oelrichs & Co		50
Page, N. & Co		574
Pilditch, F. S		15
Pratt Mfg. Co		30
Roebling's Son		1,144
Wagner, W. F		8
Wheeler & Co., E. S		120
Whitney & Co		580
Williams & W		5
Wolf & Co	33	3,423
Wright P. & Co		3
Total	1,098	28,555
Corres. date, 1888	658	32,419

Old Rails.	Tons.	Tons.
Baldwin Bros. & Co		240
Bowring & A		57
Crossman & Bro		1,598
Henderson Bros		150
Neumark & Gross		6,115
Perkins, C. L		433
Perry & Ryer		177
Sheldon & Co		203
Ward & Co., J. E		21
Wolff, H		141
Total		9,105
Corres. date, 1888		5,541

Scrap Iron.	Tons.	Tons.
Bowring, A	25	25
Burgass & Co		162
Downing & Co		321
Funch, E. & Co		397
Neumark & Gross		500
Spaulding & Co		172
Ward & Co., J. E		429
Watjen, F. & Co		152
Total	25	2,158
Corres. date, 1888		1,398

Sheet Zinc.	Lbs.	Lbs.
Crooks & Co		441,814
Lemarch's S's, H		1,554
Total		443,36

Sheet Iron.	Tons.	Tons.
Coddington & Co		456
Downing & Co		16
Kelly, Hugh		5
Total		477
Corres. date, 1888	25	1,230

Charcoal Iron.	Tons.	Tons.
Bacon & Co		97
Downing & Co		671
Lilienberg N		6
Milne & Co		94
Muller, S. & Co		135
Naylor & Co		45
Page, N. & Co		754
Total		1,802
Corres. date, 1888		404

Spiegeleisen.	Tons.	Tons.
Abbott & Co	500	2,676
Blakely & McLellan		3,100
Crocker Bros	640	8,522
Dana & Co	50	5,726
Farris & Co		325
Geisenheimer & Co	25	110
Jansen, J. A	70	9,397
Naylor & Co	300	9,380
Perkins, C. L		1,401
Walbaum Bros		675
Total	1,585	41,510
Corres. date, 1888	1,066	22,899

Iron Ore.	Tons.	Tons.
Earnshaw, A		4,971
Lawrence, Johnson & Co		480
Total		5,451
Corres. date, 1888	1,022	19,817

EXPORTS.

Copper.	Pounds.	Pounds.
Abbott & Co		463,100
Amer. Metal Co		699,527
Am. & Patterson	122,500	178,750
Belmont & Co	125,000	125,000
Fyfe, Robert		100,000
Hurst, F. W. J		113,000
Naylor & Co		1,234,500
Orford, C. & S Co		112,013
Piper, D. & Co		3,898
Seaman, Sam'l H		141,800
Total	227,500	3,161,597
Corres. date, 1888	243,633	23,424,337

Copper Matte.	
Abbott & Co	427,613
Amer. Metal Co	3,219,598
Am. & Patterson	394,200
Clark, W. A	879,019
Cortis, R. J	240,000
Henriott, F	5,293,200
Seaman, Sam'l H	13,000
Wil'ms, Terhune	1,057,092 2,455,186
Total	12,812,474 12,812,474
Corres. date, 1888	603,937 37,101,505

Copper Ore.	
Burgass & Co	32,400
R. J. Cortis	34,100
Total	66,500
Corres. date, 1888	181,959

DIVIDEND-PAYING MINES.

	Name and Location of Company.	Capital Stock.	Shares No.	Shares Par	Assessments. Total levied.	Assessments. Date and amount of last.			Dividends. Total paid.	Dividends. Date and amount of last.		
1	Adams, s. L.	Colo.	$1,500,000	150,000	$10	*	....	....	....	$555,000	Jan.	1887 15
2	Alice, s. C	Mont	10,000,000	400,000	25	*	....	....	....	775,000	Dec.	1888 .06½
3	Alma Cons., g. ...	Idah.	300,000	30,000	10	*	....	....	....	45,000	Dec.	1888 .50
4	Alturas, G	Idah.	1,500,000	300,000	5	*	....	....	....	262,500	Jan.	1888 .37½
5	Amy & Silversmith, s.	Mon.	.....	341,419	....	.....	.....	.....	.....	247,530	Aug.	1887 12½
6	Atlantic, C.	Mich	1,000,000	40,000	25	$280,000	Apl.	1875	$1.00	520,000	Feb.	1889 2.00
7	Argenta, s	Nev..	10,000,000	100,000	100	325,000	July	1885	.10	40,000	Feb.	1880 .20
8	Aspen Mg. & S., s. L.	Colo.	2,000,000	200,000	10	*	....	....	....	220,000	Jun.	1889 .20
9	Aurora, I.	Mich	2,000,000	100,000	20	*	....	....	....	155,000	Oct.	1887 1.87½
10	Bassick, G. &	Colo.	10,000,000	100,000	100	*	....	....	....	400,000	Mar.	1884 1.00
11	Belle Isle, s.	Nev..	10,000,000	100,000	100	155 000	Apl.	1889	.10	30,000	Dec.	1887 .05
12	Belcher, G. &	Nev.	10,400,000	104,000	100	2,822,000	Feb.	1889	.50	15,397,200	Jan.	1876 1.00
13	Bellevue Idaho, s. L.	Idah.	1,250,000	125,000	10	88,750	May	1889	.10	187,500	Jan	1887 10
14	Bodie Con., G. &	Cal	10,000 000	100 000	100	550,000	Mar.	1889	50	1,295,000	Apl.	1885 50
15	Boston & Mont., G.	Mon.	2,500,000	250,000	10	*	....	....	....	520,000	Jun.	1886 .10
16	Boston & Mont., C. &	Mon	2,500,000	100,000	25	*	....	....	....	500,000	Apl.	1889 1.00
17	Breece, s.	Colo	000,000	200,000	5	*	....	....	....	2,000	Feb.	1880 .01
18	Brooklyn Lead, L. &	Utah	500,000	50,000	10	*	....	....	....	127,000	July	1887 .06
19	Bulwer, G.	Cal.	10,000,000	100,000	10	105.000	Apr.	1889	.25	175 000	Jan.	1884 .10
20	Bunker Hill & Sull.	Idah.	3,000,000	300,000	10	*	....	....	....	150,000	Oct.	1883 .06⅔
21	Caledonia, G.	Dak.	10,000,000	100,000	100	505,000	May	1885	.15	112,000	July	1889 .08
22	Calumet & Hecla, C.	Mich	2,500,000	100,000	25	1,200,000	....	....	....	32,350,000	July	1889 5.00
23	Carbonate Hill s. L.	Colo.	1,500,000	200,000	10	*	....	....	....	80,000	Apl.	1884 .05
24	Carlisle, G.	N. M.	1,000,000	200,000	5	*	....	....	....	175,000	Dec.	1888 .12½
25	Castle Creek, G.	Idah.	100,000	100,000	1	*	....	....	....	51,000	Oct.	1883 .03
26	Catalpa, s. L.	Colo.	3,000,000	300,000	10	*	....	....	....	270,000	May.	1884 .10
27	Central, C.	Mich	500,000	20,000	25	100,000	Sept	1861	.06	1,930,000	Feb.	1889 2.00
28	Chrysolite, s. L.	Colo.	10,000,000	200,000	50	*	....	....	....	1,650,000	Dec	1884 .25
29	Colorado Central, s. L	Colo.	2,750,000	275,000	10	*	....	....	....	406,000	July	1889 .05
30	Confidence, s. L.	Nev..	.....	24,960	....	287,440	Apl.	1887	.50	109,680	Apl.	1889 1.00
31	Cons. Cal. & Va., G. &	Nev.	21,600 000	216,000	100	108,000	Jan.	1885	.20	3,089,800	July	1889 .50
32	Contention, s.	Ariz.	12,500,000	250,000	50	...	....	....	....	12,587,000	Dec.	1884 .25
33	**Cop. Queen Cons, C.	Ariz.	1,400 000	140,000	10	*	....	....	....	140,000	Oct.	1888 .50
34	Crescent, s. L. G.	Utah	15,000,000	600,000	25	*	....	....	....	228,000	Oct.	1888 .03
35	Crown Point, G. &	Nev..	10,000,000	100,000	100	2,825,000	Oct.	1888	.50	11,588 000	Jan.	1875 2.00
36	Daly, s. L.	Utah	3,000,000	150,000	20	...	....	....	....	1,087,50	Jun.	1889 .25
37	Deer Creek, G.	Idah.	1 000,000	200,000	5	*	....	....	....	20,000	Jun.	1889 .05
38	Deadwood-Terra, G.	Dak.	5,000,000	200,000	25	*	....	....	....	11,000,000	Nov.	1887 .10
39	Derbec B. Grav., G. &	Cal.	10,000,000	100,000	100	90,000	Dec.	1881	.10	180.000	May	1881 .10
40	Dunkin, s. L.	Colo.	5,000,000	200 000	25	*	....	....	....	380,000	July	1889 05
41	Dunstone, G. s. L.	Mont	1,000,000	200,000	5	*	....	....	....	6,000	Nov.	1888 .03
42	Eclipse	Colo.	100,000	100,000	1	.....	.....	.....	.....	20,000	Nov.	1887 .10
43	Elkhorn, G. &	Mont	1,000,000	100,000	10	50,000	July	1883	.50	170,000	Nov.	1887 .05
44	Empire L., G.	Mont	500,000	100,000	5	.....	....	....	....	70,500	Oct.	1887 .37½
45	Eureka Con., G. & L.	Nev..	5,000,000	50,000	100	550,000	Jun.	1889	.50	4,955,000	July	1888 .25
46	Evening Star, s. L.	Colo.	500,000	30,000	10	*	....	....	....	1,425,000	Apl.	1889 .25
47	Excelsior, G.	Cal..	10,000,000	100,000	100	560,000	Sept	1885	1.00	875.000	Oct.	1880 .25
48	Father de Smet, G.	Dak..	10,000,000	100 000	100	200,000	Nov	1878	1.00	1,125,000	Dec.	1885 .20
49	Franklin, C.	Mich	1,000,000	40,000	25	220,000	Jun.	1871	....	800,000	Dec.	1888 2.00
50	Freeland, G. & C.	Colo.	5,000,000	200,000	25	*	....	....	....	190,000	July	1886 .10
51	Fresno Enterprise, G	Cal..	5,000,000	100,000	50	.....	Mch	1883	.10	110,000	July	1882 .10
52	Garfield Lt., G. &	Nev.	500,000	100,000	5	.....	....	....	....	85,000	Apl.	1883 .12½
53	Golconda, G. &	Idah.	1,000,000	100,000	10	*	....	....	....	120,000	May	1888 .60
54	Gould & Curry, G. &	Nev..	10,800,000	108,000	100	4,402,200	May	1889	.30	928,800	Oct.	1870 10.00
55	Grand Central, S.	Ariz.	1,000,000	100,000	10	.....	....	....	....	625,000	Dec	1882 .25
56	Grand Prize, G.	Nev..	10,000,000	100,000	100	625,000	Mar.	1889	.30	497 000	Mar.	1884 .25
57	Granite, s. L.	Idah.	500,000	500,000	1	*	....	....	....	10,000	Jun.	1888 .02
58	Granite Mountain, s.	Mont	10,000,000	400,000	25	.....	....	....	....	6,700,000	Jun.	1889 .75
59	Green Mountain, G.	Cal..	1,250,000	125,000	10	*	....	....	....	212.000	Nov.	1881 .07½
60	Hale & Norcross, G. &	Nev.	11,200,000	112,000	100	5,086,000	July	1887	.50	1 822,000	Aug.	1888 .50
61	Hecla Con., G. L. C.	Mont	1,500,000	30,000	50	.....	....	....	....	1,332.500	May	1889 .50
62	Hel'a Mg & Red, G. & L.	Mont	3,315,000	663,000	5	*	....	....	....	197,270	July	1886 .06
63	Holmes, S.	Nev.	10,000,000	100,000	100	300,000	Sept	1885	.10	75,000	Apl	1886 .25
64	Holyoke, G.	Idah	200,000	200,000	1	*	....	....	....	27,000	Feb	1883 .10
65	Homestake, G.	Dak..	12,500,000	125,000	100	200,000	July	1878	1.00	4,405,750	Jun	1889 .10
66	Honorine, s. L.	Utah	500,000	250,000	2	37,500	Apl.	1889	.05	125.000	Sept	1887 .05
67	Hope, S.	Mont	1,000,000	100,000	10	*	....	....	....	233,252	Apl.	1888 .25
68	Horn-Silver, G. &	Utah	10,000,000	400,000	25	*	....	....	....	4,000,000	Nov.	1884 .50
69	Hubert, G.	Colo.	500,000	50,000	10	*	....	....	....	239.500	Oct.	1888 .11
70	Idaho, G.	Cal..	310,000	3,100	100	.....	....	....	....	5,166,150	Jun.	1889 5.00
71	Ideal, s. L.	Colo.	1,500,000	50,000	10	*	....	....	....	15,000	Oct.	1886 .05
72	Illinois, s.	N. M.	100,000	100,000	10	*	....	....	....	45,000	Apl	1889 .20
73	Independence, S.	Nev..	10,000,000	100,000	100	340,000	Oct.	1886	.20	225,000	Sept	1879 .25
74	Iron Hill, s.	Utah.	2,500,000	250,000	10	126,500	Jan.	1889	.03	156,250	Nov	1887 .07½
75	Iron-Silver, s. L.	Colo.	10,000,000	500,000	20	*	....	....	....	2,500,000	Apl.	1889 .20
76	Jackson, G. &	Nev	5,000,000	50.000	100	237,500	Nov	1880	.20	55.000	Jun	1889 .10
77	Jay Gould	Mont	2,000,000	40,000	5	*	....	....	....	365,000	Apl.	1889 .04
78	Jocusitita, 4	Mex.	2,500,000	250,000	10	.....	....	....	....	1,200,000	Feb.	1889 .50
79	Jumbo, G.	Colo.	2,000,000	200,000	10	*	....	....	....	35.000	Oct.	1887 .02½
80	Kentuck,	Nev	10,000,000	100,000	100	351,000	Apl.	1889	.30	1,350,000	Dec.	1886 .10
81	La Plata, s. L.	Colo	2,000,000	200,000	10	*	....	....	....	610,000	Sept	1882 .30
82	Leadville Cons., s. L.	Colo.	4,000,000	400,000	10	*	....	....	....	423,000	Apl.	1887 .05
83	Lexington, G. s.	Mont	4,000,000	40,000	100	*	....	....	....	565,000	Jan.	1885 2.00
84	Little Chief, s. L.	Colo.	10,000,00	200,000	50	*	....	....	....	800,000	July	1888 .10
85	Little Pittsburg, s. L.	Colo.	20,000,000	200,000	100	*	....	....	....	1,050,000	Mch.	1886 .50
86	Marion Bullion, G.	Nev.	500,000	10	....	.....	.....	.....	.....	15,000	Jan.	1886 .....
87	Martin White, S.	Nev..	10,000,000	100,000	100	1,175,000	Jan.	1889	.25	140.000	Dec.	1886 .25
88	Mary Murphy, G. &	Colo.	350,000	3,500	100	*	....	....	....	175,000	May	1888 5.00
89	Minnesota, C	Mich	1,000,000	40,000	25	420,000	Apl.	1886	1 00	1,826,000	Mar.	1876 .....
90	Mono, G.	Cal.	5,000,000	50,000	100	65,350	Mar.	1889	.25	12.500	Mar.	1886 .25
91	Montana, L., G. &	Mont	3,300,000	660,000	5	*	....	....	....	2,272,785	July	1889 .06¼
92	Morning Star, s. L.	Colo.	1,000,000	100,000	10	*	....	....	....	775,000	May	1888 .25
93	Moulton, s. G.	Mont	2,000,000	400,000	5	*	....	....	....	380,000	Dec.	1887 .07½
94	Mount Pleasant, G.	Cal.	250,000	150,000	....	*	....	....	....	150,000	Feb.	1887 .30
95	Mt. Diablo, s.	Nev.	5,000,000	50,000	100	137,500	Jun.	1880	2.00	140,000	Jan.	1889 .40
96	Napa, q	Cal.	700,000	100,000	7	*	....	....	....	310,000	July	1889 .10
97	Navajo, G. &	Ney.	10,000,000	100,000	100	485,000	Apl.	1888	.30	365,000	Apl.	1889 .10
98	New Guston, S. &	Colo.	500,000	150,000	5	.....	....	....	....	100,000	Dec.	1888 .50
99	N. Hoover Hill, G. &	N. C	300,000	120,000	2½	*	....	....	....	30,000	Dec.	1885 .06⅔
100	Northern Belle, s.	Nev..	5,000,000	5 0,000	100	425,000	Jan.	1884	8.00	2,400,000	Apl.	1883 50
101	North Belle Isle, s.	Nev.	10,000,000	100,000	100	380,000	Jan	1889	.30	230.000	May	1888 .50
102	North Star, G.	Cal..	1,000,000	100,000	10	*	....	....	....	150,000	Dec.	1888 .50
103	Ontario, s. L.	Utah	15,000,000	150,000	100	.....	....	....	....	10,175,000	Jun.	1889 .50
104	Ophir, G. & S.	Nev.	10,000,000	100,000	100	4,159,440	May	1889	.50	1,985,380	July	1882 1.00
105	Original, s. C.	Mont	1,500,000	60,000	25	*	....	....	....	123.000	July	1888 .05
106	Osceola, C.	Mich	1,250,000	50,000	25	480,000	Apl.	1876	1.60	1,222,500	Mar.	1889 1 00
107	Oxford, G.	N. S.	125.000	125,000	1	*	....	....	....	74,500	Sept	1888 .02
108	Paradise Valley, G. &	Nev.	10,000,000	100,000	100	57,000	Apl.	1888	.15	150,000	Apl.	1887 .10
109	Parrot, C.	Mont	1,800,000	180,000	10	*	....	....	....	372,000	May	1889 .10
110	Peacock, G. & S.	N. M.	3,000,000	300,000	10	*	....	....	....	60,000	Nov.	1888 .....
111	Plumas Eureka, G.	Cal.	1,406,250	140,625	10	*	....	....	....	2,495,312	Apl.	1889 .50
112	Plutus, G. & C. L.	Colo.	2,000,000	200,000	10	*	....	....	....	20,000	Feb.	1886 .10
113	Plymouth Con., G.	Cal.	5,000,000	100,000	50	*	....	....	....	2.280.000	Feb.	1888 40
114	Quicksilver, pref., Q.	Cal..	4,300,000	43,000	100	.....	....	....	....	1,599,593	May	1889 1.50
115	" " com., Q.	Cal..	5,700,000	57,000	100	.....	....	....	....	643,867	July	1882 .40
116	Quincy, C. &	Mich	1,000,000	40,000	25	200,000	Dec.	1862	....	5,170,000	Feb.	1889 5.00
117	Richmond, s. L.	Nev..	1,350,000	54,000	25	*	....	....	....	4,312,587	Jun.	1887 1.25
118	Ridge, C.	Mich.	500,000	20,000	25	219,939	Mar	1886	.50	99,785	Feb.	1880 .50
119	Robinson Con., s. L.	Colo.	10,000,000	200,000	50	*	....	....	....	585,000	Mar.	1886 .05
120	Robert E. Lee, s. L.	Colo	10,000,000	500,000	20	*	....	....	....	100,000	Dec.	1882 .50
121	Savage, S.	Nev..	11,200,000	112,000	100	6,486,000	Jan.	1889	50	4,460,000	July	1869 3.00
122	Shoshone, G.	Idah.	150,000	150,000	1	*	....	....	....	7,000	Apl.	1883 .01
123	Sierra Buttes, G.	Cal..	2,225 000	122,500	10	*	....	....	....	1,568,145	Apl.	1888 .12½
124	Sierra Nevada, G. &	Nev..	10,000,000	100.000	100	6,200,000	Jun.	1889	.25	102,000	Jan.	1871 1.00
125	Sierra Nevada, s. L.	Idaho	1,000,000	1	1	*	....	....	....	40,000	May	1889 .02
126	Silver Cord, G. & S. L.	Colo.	5,000,000	500,000	10	*	....	....	....	275,000	Apl.	1889 .10
127	Silver King, s.	Ariz.	10,000,000	100,000	100	50,000	Jun.	1888	.50	1,950,000	July	1887 .25
128	Silver Mg., of L. V.	N. M.	5,000,000	500,000	10	*	....	....	....	25,000	June	1889 .05
129	Silverton, G. & L.	Colo.	2,000,080	200,000	10	*	....	....	....	50,000	Nov.	1886 .02
130	Small Hopes Cons., s.	Colo.	5,000,000	250,000	20	*	....	....	....	3,137,500	Jun	1889 .10
131	Smuggler, s. L.	Colo.	600.000	60,000	10	*	....	....	....	66,700	Aug.	1883 .25
132	Spring Valley, G.	Cal..	200,000	200,000	1	50,000	Oct.	1886	.25	50.000	Jan	1881 25
133	Standard, G. &	Cal..	10 000,000	100,000	100	25,000	Oct.	1884	.25	8,595,000	Jun.	1888 .05
134	Stormont, s.	Utah	500,000	2500,000	1	*	....	....	....	155,000	Nov	1881 .05
135	St. Joseph, L.	Mo..	1,500,000	150,000	10	*	....	....	....	344,000	Dec.	1887 .20
136	Surinam, G.	D. G.	3,000,000	600,000	5	*	....	....	....	105.000	Nov.	1887 .05
137	Swansea, G.	Colo.	600,000	60,000	10	*	....	....	....	9,000	Apl.	1888 .02½
138	Syndicate, G.	Cal..	10,000,000	100,000	100	38,729	July	1882	.15	48,308	Sept	1885 .10
139	Tamarack, C.	Mich.	1,000,000	40,000	25	520,000	Apl.	1885	3.00	960,000	July	1889 3.00
140	Tip Top, s.	Colo.	10,000,000	100,000	100	250,000	Sept	1883	.25	100,000	Nov	1881 .20
141	Tombstone, G. & L.	Ariz.	12,500,000	500,000	25	*	....	....	....	1,250,000	Apl.	1882 .10
142	United Verde, C.	Ariz.	3,000,000	300,000	10	*	....	....	....	97,500	Feb.	1884 .20
143	Valencia, M.	N. H.	150.000	1,500	100	*	....	....	....	37,500	Apl	1886 2.50½
144	Viola L., s. L.	Idah.	750,000	150,000	5	*	....	....	....	272,500	Oct.	1888 .37½
145	Ward Cons., s. L.	Colo.	2,000,000	200,000	10	.....	....	....	....	10,000	Apl.	1889 .05
146	Yankee Girl	Colo.	2,500,000	250,000	10	*	....	....	....	1,275,000	July	1887 .10
147	Yellow Jacket, G. &	Nev..	12,000,000	120,000	100	5,508,000	Mar	1889	.50	2,184,000	Aug	1871 1.50
148	Webb City, L. Z.	Mo..	55,000	11,000	5	.....	....	....	....	3,300	Jun	1889 .10
..	.....	.....	.....	.....	....	.....	.....	.....	.....	.....	.....	....

NON-DIVIDEND-PAYING MINES

	Name and Location of Company.	Capital Stock.	Shares No.	Shares Par Value	Assessments. Total levied	Assessments. Date & am't of last.		
1	Agassis Cons., s. L.	Colo.	$2,500,000	50,000	$50	*	....	....
2	Alloues, C.	Mich	2,000,000	80,000	25	$697,000	Mar.	1889 .50
3	Alpha Con., G. s.	Nev..	3,000,000	30,000	100	562,500	Nov.	1888 87½
4	Alta, s.	Nev..	10,080,000	100,800	100	2,248,800	Sept	1888 .50
5	Amador, G.	Cal..	400,000	200,000	2	*	....	....
6	American Flag, s.	Colo.	1,250,000	125,000	10	300,000	Jun	1877 .5
7	Anglo-Montana, Lt.	Mon.	600,000	120,000	5	.....	....	....
8	Appalachian, Lt., G.	N. C	1,500,000	300,000	5	.....	....	....
9	Astoria, G.	Cal..	200,000	100,000	2	.....	....	....
10	Barcelona, G.	Nev..	5,000,000	200,000	25	*	....	....
11	Bechtel Con., G.	Cal.	10,000,000	100,000	100	173,500	Jan.	1883 .10
12	Belmont, S.	Nev.	5,000,000	50,000	100	735,000	Apl.	1886 .10
13	Best & Belcher, G. &	Nev.	10,080,000	100,800	100	2,130,190	Jun	1889 .25
14	Big Pittsburg, s. L.	Colo	20,000,000	200,000	100	*	....	....
15	Bi-Metallic, s.	Mon	5,000,000	200,000	25	*	....	....
16	Black Oak, G.	Cal..	3,000,000	300,000	10	*	....	....
17	Boston Con., G.	Cal.	10,000,000	100,000	100	170.000	Nov	1883 .25
18	Bremen, s.	N. M	5,000,000	500,000	10	*	....	....
19	Brunswick, S.	Cal.	2,000 000	400,000	5	*	....	....
20	Bullion, G. &	Nev	10,000,000	100,000	100	4,007,000	Aug.	1888 .50
21	Calaveras, G.	Cal..	500,000	500,000	1	*	....	....
22	Carisa, G.	Wy.	500.000	100,000	5	*	....	....
23	Carupano, G. & L. C.	Ven.	200,000	100,000	2	*	....	....
24	Cashier, G.	Colo.	500,000	250,000	2	*	....	....
25	Cen. Contin'l, G. & L.	Colo.	2,000,000	200,000	10	*	....	....
26	Charles Dickens, G. &	Idah.	1,250,000	250,000	5	*	....	....
27	Cherokee, G.	Cal.	1,500,000	150,000	10	.....	....	....
28	Chollar, S.	Nev..	11,200,000	112,000	100	1,428,000	Oct.	1888 50
29	Cleveland, T.	Dak.	1,000,000	500,000	2	*	....	....
30	Colchis,	N. M.	500,000	50,000	10	.....	....	....
31	Commonwealth, S.	Nev.	10,000,000	100,000	100	170,000	Nov	1886 .50
32	Comstock, G. &	Nev.	10,000,000	100,000	100	30 000	Mar.	1887 15
33	Con. Imperial, G. &	Nev.	5,000,00	50,000	100	1,800,000	Nov.	1888 .05
34	Con. Pacific, G.	Cal.	6,000 000	60,000	100	180,000	F b	1889 .15
35	Cons Silver, S.	Mo..	2,500,000	250,000	10	.....	....	....
36	Courtland, S.	Colo	500,000	50,000	10	.....	....	....
37	Crescent, S. L.	Colo.	3,000,000	300,000	10	.....	....	....
38	Crocker, S.	Aria	10,000,000	100,000	100	125,000	Jun.	1889 .10
39	Crowell, G.	N. C	500,000	500,000	1	*	....	....
40	Dahlonega, G.	Ga.	250,000	250,000	1	*	....	....
41	Dandy, S.	Colo.	5,000,000	500,000	10	.....	....	....
42	Dardanelles, G.	Cal..	1,000,000	100,000	10	*	....	....
43	Decatur, S.	Colo.	1,500,000	300,000	5	*	....	....
44	Denver City, s. L.	Colo.	5,000,000	500,000	10	*	....	....
45	Denver Gold, G.	Colo.	300,000	60,000	5	*	....	....
46	Durango, G.	Colo.	500,000	500,000	1	*	....	....
47	Eastern Dev. Co., Lt.	N. S.	1,500,000	150 000	10	990,000	Mar.	1886 1.00
48	El Cristo, G. &	U.S.C	1,000,000	500,000	2	*	....	....
49	El Dorado, G.	Cal.	1,000,000	250,000	4	*	....	....
50	El Talento, G.	U.S.C	1,000,000	500,000	2	*	....	....
51	Empire, s.	Utah	10,000,000	100,000	100	.....	....	....
52	Eureka Tunnel, s. L.	Nev..	10,000,000	100,000	100	*	....	....
53	Exchequer	Nev..	10,000,000	100,000	100	815.000	Apl.	1889 .25
54	Found Treasure, G. &	Nev..	10,000,000	100,000	100	30,530	Apl	1889 12½
55	Gogebic Cons., I.	Wis.	5,000,000	200,000	25	.....	....	....
56	Gold Cup, S.	Colo.	500,000	500,000	1	*	....	....
57	Golden Era, S.	Mon.	2 000,000	200,000	10	*	....	....
58	Gold Placer, G.	Colo.	5,000,000	200,000	25	229,314	Dec.	1886 .25
59	Gold Rock, G.	Cal.	1,000,000	500,000	2	*	....	....
60	Goodshaw, G.	Cal.	10,000,000	100,000	100	*	....	....
61	Grand Reef, G.	Tex.	12,000,000	120,000	100	.....	....	....
62	Graad Duke	Colo.	800,000	80,000	10	*	....	....
63	Great Remance, G.	U.S.C	1,000,000	500,000	2	*	....	....
64	Gregory-Bobtail, G.	Colo.	550,000	550,000	1	*	....	....
65	Gregory Con., G.	Mon.	3,000,000	300,000	10	.....	....	....
66	Harlem M. & M. Co, G	Cal..	1 000,000	200,000	5	.....	....	....
67	Hartland. & Tr. s. G	Ariz.	10,000,000	100,000	100	.....	....	....
68	Hector, G.	Colo.	1,500,000	300,000	5	45,000	Jan.	1889 .15
69	Highland, C.	Mich	500,000	25,000	20	.....	....	....
70	Hollywood	Cal..	200,000	100,000	2	.....	....	....
71	Hortense, s.	Colo.	2,000,000	200,000	10	*	....	....
72	Huron, C.	Mich	1,000,000	40,000	25	280,000	May	1887 3.00
73	Iron Cap & Silver, s.	N. M.	2,000,000	200,000	10	*	....	....
74	Ironton, I.	Wis.	1,000,000	40 000	25	.....	....	....
75	Iroquois, C.	Mich	1,250,000	50,000	25	.....	....	....
76	J. D. Reymert	Ariz.	10,000,000	100,000	100	*	....	....
77	Julia Cons., G. s.	Nev..	11,000,000	110,000	100	1,660,000	Jan.	1889 .10
78	Kearsarge, C.	Mich	1,250,000	50,000	25	190,000	Oct.	1887 1.00
79	Lacrosse, G.	Colo.	1,000,000	100,000	10	*	....	....
80	Lee Basin, s. L.	Colo.	5,000,000	500,000	10	*	....	....
81	Mammoth Bar., G.	Cal..	10,000,000	100,000	100	50,000	Dec.	1881 ....
82	May Belle, G.	Cal..	10,000,000	100,000	100	84,000	Mar.	1884 .15
83	Mayflower Gravel.,	Cal..	1,000,000	100,000	10	485,000	Jan	1889 .50
84	Medora, G.	Dak.	250,000	250,000	1	.....	....	....
85	Mexican, G. &	Nev.	10,000,000	100,000	100	2 750,760	Mar	1889 .35
86	Middle Bar G.	Cal..	400,000	200,000	2	*	....	....
87	Mike & Starr, s. L.	Colo	1,000,000	200,000	5	*	....	....
88	Monitor, G.	Colo.	100,000	100,000	1	*	....	....
89	Moose Silver, s.	Colo.	3,000,000	300,000	10	*	....	....
90	Mutual Mg. & Sm.	W'sh	100,000	100,000	1	*	....	....
91	Native, C.	Mich	1,000,000	40,000	25	.....	....	....
92	Neath, G.	Colo.	1,000,000	100,000	10	.....	....	....
93	Nevada Queen, s.	Nev	10,000,000	100,000	100	230,000	Jun.	1889 .50
94	New Germany, G.	N. S.	100,000	100,000	1	*	....	....
95	New Pittsburg, s. L.	Colo	2,000,000	200,000	10	*	....	....
96	N. Commonw'h, s.	Nev.	10,000,000	100,000	100	60,000	Apl	1889 .30
97	North Standard, G.	Cal..	10,000,000	100,000	100	20,000	Nov	1888 ....
98	Noonday,	Cal.	600,000	60,000	10	208,000	Dec.	1881 .10
99	Oneida Chief, G.	Cal.	500,000

NEW YORK MINING STOCKS QUOTATIONS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	July 6.		July 8.		July 9.		July 10.		July 11.		July 12.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Adams, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Argenta, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Aspen Mg & S., Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Atlantic, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Belcher, Nev	....	....	....	....	....	....	....	....	....	....	2.85	....	200
Belle Isle, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Bodie Cons., Cal	1.75	....	....	....	....	....	....	....	....	....	....	....	200
Boston & Mont, Mont.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Bulwer, Cal	....	....	....	....	....	....	....	....	....	....	....	....	.....
Caledonia, Dak	3.00	....	....	....	3.10	3.00	....	....	3.00	....	....	....	600
Calumet & Hecla	....	....	....	....	....	....	....	....	....	....	....	....	.....
Catalpa, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Cholliar, Nev	1.35	....	....	....	....	....	1.40	....	....	....	1.60	....	450
Colorado Cent'l, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Cons. Cal. & Va., Nev.	7.50	....	....	....	7.87	7.75	7.38	....	7.75	....	....	....	630
Crown Point, Nev	....	....	....	....	....	....	....	....	....	....	2.25	....	125
Deadwood	....	....	....	....	....	....	1.40	....	....	....	....	....	1
Eureka Cons., Nev	....	....	....	....	....	....	2.20	....	....	....	....	....	200
Father de Smet, Dak	....	....	....	....	....	....	....	....	....	....	....	....	.....
Franklin, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Gould & Curry, Nev	2.25	....	....	....	....	....	....	....	....	....	....	....	100
Grand Prize, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Hale & Norcross, Nev	....	....	....	....	....	....	3.00	....	....	....	....	....	400
Holyoke, Id	....	....	....	....	....	....	....	....	....	....	....	....	.....
Homestake, Dak	....	....	....	....	....	....	9.50	....	....	....	....	....	60
Horn Silver, Ut	.95	....	.94	....	1.00	.97	....	....	.93	....	1.00	....	1,100
Iron Hill, Dak	....	....	....	....	....	....	....	....	....	....	.37	....	100
Iron Silver, Colo	....	....	....	....	....	....	....	....	2.00	....	....	....	1,000
Leadville C., Colo	....	....	.10	....	....	....	....	....	....	....	....	....	300
Little Chief, Colo	....	....	....	....	.32	....	.30	....	.32	....	.32	....	2,400
Little Pittsburg, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Mono, Cal	....	....	....	....	....	....	....	....	....	....	....	....	.....
Moulton, Mont	....	....	....	....	....	....	....	....	....	....	....	....	.....
Mount Diablo, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Navajo, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
New Belle Isle, Nev	....	....	....	....	....	....	1.15	....	1.05	....	....	....	300
North Star, Cal	....	....	....	....	....	....	....	....	....	....	....	....	.....
Oat Hog, Cal	....	....	....	....	....	....	....	....	....	....	....	....	.....
Ophir, Nev	5.25	....	....	....	....	....	....	....	....	....	....	....	100
Osceola, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Plutus, Colo	.84	....	.82	....	.82	....	....	....	....	....	....	....	900
Plymouth, Cal	8.50	8.25	....	....	....	....	8.63	8.00	8.50	....	8.50	....	900
Quicksilver Pref., Cal	....	....	....	....	....	....	....	....	....	....	....	....	.....
" Com., Cal	6.00	....	6.70	....	....	....	....	....	....	....	....	....	200
Quincy, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Robinson Cons. Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Savage, Nev	....	....	....	....	....	....	1.70	....	....	....	....	....	100
Sierra Nevada, Nev	2.30	....	....	....	....	....	....	....	....	....	....	....	200
Silver King, Ariz	1.05	....	1.00	.95	1.00	....	1.00	....	1.00	....	1.05	1.00	960
Silver Mg. of L. V	....	....	....	....	....	....	....	....	....	....	....	....	.....
Small Hopes, Colo	....	....	1.50	....	....	....	....	....	....	....	....	....	100
Standard	1.10	....	....	....	1.00	....	1.00	....	1.00	....	....	....	1,200
Tamarack, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....

NON-DIVIDEND-PAYING MINES

NAME AND LOCATION OF COMPANY.	July 6.		July 8.		July 9.		July 10.		July 11.		July 12.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Allouez, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Alta, Nev	....	....	....	....	1.45	....	1.40	....	1.40	....	1.35	....	600
Amador, Cal	....	....	....	....	....	....	....	....	....	....	....	....	.....
American Flag, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Astoria, Cal	.20	....	....	....	.20	....	.20	....	.20	....	.20	....	1,6 0
Barcelona, Nev	.50	....	.50	.35	....	....	....	....	....	....	....	....	2,900
Best & Belcher, Nev.	3.40	....	....	....	....	....	....	....	....	....	....	....	200
Brunswick, Cal	....	....	....	....	....	....	....	....	....	....	....	....	.....
Buffalo Iron Min'g	....	....	....	....	....	....	....	....	....	....	....	....	.....
Bullion, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Cashier, Colo	.01	....	....	....	....	....	.85	....	....	....	....	....	200
Castle Creek, Id	....	....	....	....	....	....	....	....	....	....	....	....	10
Colchis, N. M	....	....	....	....	....	....	....	....	....	....	....	....	.....
Commonw'th, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Con. Imperial, Nev	....	....	....	....	....	....	....	....	4.00	....	....	....	100
Con. Pacific, Cal	....	....	....	....	....	....	....	....	....	....	....	....	.....
Denver City, Colo	....	....	.08	....	....	....	....	....	....	....	....	....	100
Eastern Oregon	....	....	.01	....	....	....	....	....	....	....	....	....	1,000
El Cristo, Rep of Col	1.40	1.35	....	....	....	....	....	....	....	....	....	....	400
Excelsior, Cal	....	....	....	....	....	....	....	....	....	....	....	....	.....
Exchequer Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Hector, Cal	....	....	....	....	....	....	....	....	....	....	....	....	.....
Julia, Nev	....	....	....	....	....	....	....	....	.20	.15	....	....	800
Kingst'n & Pemb'ke	....	....	....	....	....	....	....	....	....	....	....	....	.....
Kossuth, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Lacrosse, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Lee Basin, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Mexican, Nev	3.45	....	....	....	....	....	....	....	....	....	....	....	130
Middle Bar, Cal	.23	....	.23	....	.23	....	.23	....	....	....	....	....	1,100
Monitor, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Mutual Sm. & M. Co	1.45	....	1.45	....	1.45	....	1.45	....	1.45	....	1.45	....	1,100
Nevada Queen, Nev	....	....	....	....	....	....	....	....	....	....	1.65	....	100
N. Con'n'w'th, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Occidental, Nev	....	....	....	....	....	....	1.65	....	....	....	1.65	....	2.30
Oriental & Mil., Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Phœnix of Ariz	.25	....	....	....	....	....	....	....	....	....	....	....	100
Potosi, Nev	....	....	....	....	....	....	1.70	....	1.65	....	....	....	300
Rappahannock, Va	.07	....	.07	....	.07	....	.07	....	.07	....	.07	....	5,900
S. Sebastian, San S	....	....	....	....	....	....	....	....	....	....	....	....	.....
Scorpion, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Shoshone Idaho	....	....	....	....	....	....	....	....	....	....	....	....	.....
Silver Cord	....	....	....	....	....	....	....	....	....	....	....	....	.....
Silver Hill, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Silver Queen	....	....	....	....	....	....	....	....	....	....	....	....	.....
Sullivan Con	....	....	....	....	....	....	....	....	....	....	....	....	.....
Sutro Tunnel, Nev	....	....	.07	.06	....	....	....	....	.57	....	.06	....	1,600
" Trust Cert	....	....	....	....	....	....	....	....	....	....	....	....	.....
Tornado, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Union Con., Nev	....	....	....	....	....	....	....	....	3.0	....	....	....	50
United Copper	1.05	....	1.10	....	1.05	....	1.10	....	1.15	....	1.05	....	1,200
Utah, Nev	....	....	....	....	.90	....	....	....	.85	....	....	....	350
	....	....	....	....	....	....	....	....	....	....	....	....	.....
	....	....	....	....	....	....	....	....	....	....	....	....	.....

*Ex. dividend. †Dealt in at the New York Stok Ex. Unlisted securities. ‡Assessment unpaid. Dividend shares sold, 3 3 5. Non-dividend shares sold, 2 ,350. Total New York, 34,675.

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY.	July 5.		July 6.		July 8.		July 9.		July 10.		July 11.		SALES.
Atlantic, Mich	9.50	9.25	9 00	....	....	....	....	....	....	....	....	....	35
Bodie, Cal	....	....	....	....	....	....	....	....	....	....	....	....	.....
Bonanza Developm't	.75	....	.80	.75	....	....	....	....	....	....	.65	.50	500
Bost. & Mont., Mont	36 00	35.75	35.50	35 13	35.00	34.25	33.50	33.25	35.00	33.25	34.75	34 25	2,327
Breece, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Calumet & Hecla, Mich	2 9	207	208	....	208	....	208	207	208	....	207	....	128
Catalpa, Colo	.12	....	....	....	....	....	....	....	....	....	....	....	250
Central, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Chrysolite, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Con. Cal & Va., Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Dunkin, Colo	1.05	....	....	....	....	....	....	....	....	....	....	....	300
Enterprise	....	....	....	....	....	....	....	....	....	....	....	....	.....
Franklin, Mich	9.50	....	....	....	9.00	....	9.00	9.00	....	....	....	....	120
Hale & Norcross, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Honorine, Utah	....	....	....	....	....	....	....	....	....	....	....	....	.....
Little Chief, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Little Pittsburg, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Martin White, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Mono, Cal	....	....	....	....	....	....	....	....	....	....	....	....	.....
Napa, Cal	....	....	....	....	....	....	....	....	....	....	....	....	.....
Ontario, Utah	....	....	....	....	....	....	....	....	....	....	....	....	.....
Osceola, Mich	....	....	9.00	....	....	....	9.00	....	8.75	8.50	....	....	189
Pewabic, Mich	....	....	....	....	....	....	....	....	2.00	....	....	....	100
Quincy, Mich	57 50	....	60.00	....	50 00	49.00	50.00	....	50.00	....	50.00	....	74
Ridge, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Sierra Nev., Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Silver King, Ariz	....	....	....	....	....	....	....	....	....	....	....	....	.....
Standard, Cal	....	....	....	....	....	....	....	....	....	....	....	....	.....
Tamarack, Mich	....	....	....	....	100	96	....	....	98	....	....	....	66

NAME OF COMPANY	July 5		July 6.		July 8.		July 9		July 10		July 11.		SALES
Allouez, Mich	....	....	....	....	.90	....	....	....	....	....	.70	....	130
Arnold, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Aztec, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Brunswick, Cal	....	....	....	....	....	....	....	....	....	....	....	....	.....
Butte & Bost., Mont	....	....	....	....	24 00	....	24.00	....	22.00	....	....	....	80
Canada	....	....	....	....	....	....	....	....	....	....	....	....	.....
Cashier, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Crescent, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Denver City, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
El Cristo, Rep of Col	....	....	....	....	....	....	....	....	....	....	....	....	.....
Everett, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Hanover, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Humboldt, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Hungarian	....	....	....	....	....	....	....	....	....	....	....	....	.....
Huron, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Kearsarge, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Mesnard, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
National, Mich	1.00	....	....	....	....	....	....	....	....	....	....	....	100
Native, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Pontiac, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Rappahannock, Va	....	....	....	....	....	....	....	....	....	....	....	....	.....
Rockland	....	....	....	....	....	....	....	....	....	....	....	....	.....
Santa Fe, N. Mex	.60	....	.60	....	.70	....	.55	.50	.50	.43	.50	45	15,964
Security, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Shoshone Idaho	....	....	....	....	....	....	....	....	....	....	....	....	.....
South Side, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
St. Louis Cop., Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Sullivan, Dak	....	....	....	....	....	....	....	....	....	....	....	....	.....

Boston: Dividend shares sold, 4,139. Non-dividend shares sold, 16,264. Total Boston, 20,403.

COAL STOCKS.

NAME OF COMPANY.	Par val. of sh'rs.	July 6.		July 8.		July 9.		July 10.		July 11.		July 12.		Sales.
		H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
American Coal	....	....	....	....	....	....	....	....	....	....	....	....	....	.....
Cambria Iron	....	....	....	....	....	....	....	....	....	....	....	....	....	.....
Cameron Coal & Iron Co	....	30⅜	....	....	....	....	....	....	....	....	....	....	....	.....
Ches. & O. RR	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
Chic. & Ind. Coal RR	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
Do. pref	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
Col. & Hocking Coal	100	14½	....	14½	15⅛	15	....	....	....	15	....	14½	14¼	960
Col., C. & I	100	....	....	29	30	29	....	30⅛	30	....	....	....	....	1,020
Consol. Coal	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
Del. & H. C	100	146½	145⅝	145¼	144¾	....	....	145½	145	145½	145¼	145⅝	145½	2,360
D., L. & W. RR	50	145¼	144⅜	145⅜	144⅛	144½	....	145⅜	144⅞	146	145⅝	145¾	144¾	46,870
Hocking Valley	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
Hunt. & Broad Top	....	....	....	....	....	....	....	....	....	....	....	....	....	.....
Do. pref	....	....	....	....	....	....	....	....	....	....	....	....	....	.....
Lehigh C. & N	50	53¾	....	137⅛	130	....	....	52⅛	52	....	....	....	....	359
Lehigh & W. B. Coal	....	....	....	....	....	....	....	....	....	....	....	....	....	.....
Lehigh Valley RR	50	53½	....	53⅜	53¼	53¼	53⅛	53¼	53⅛	53¼	53⅛	....	....	1,200
Marshall Con. Coal	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
Do. pref	....	....	....	....	....	....	....	....	....	....	....	....	....	.....
Mahoning Coal	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
Maryland Coal	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
Morris & Essex	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
New Central Coal	50	....	....	....	....	....	....	8	....	....	....	....	....	100
N. J. C. RR	100	112	....	112⅝	111	114½	113⅛	114½	113⅞	114¼	113¾	114	113	12,439
N. Y. & S. Coal	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
N. Y., Susq. & Western	100	....	....	8	....	8	....	....	....	8	....	....	....	900
Do. pref	100	33½	....	31¾	32	31	31¾	....	....	....	....	33⅜	....	800
N. Y. & Perry C. & I	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
Norfolk & Western R R	50	....	....	....	....	....	....	....	....	....	....	....	....	.....
Do. pref	50	50⅛	....	50⅜	50	50⅛	....	50¼	....	50¾	50¼	51	....	1,820
Penn. Coal	50	....	....	....	....	....	....	....	....	....	....	....	....	.....
Penn. RR	50	51⅝	50⅜	51⅜	51¼	51⅛	51⅜	51⅝	50⅛	51⅝	51⅜	....	....	2,419
Ph. & R. RR.**	....	47⅛	4.¾	46⅛	45⅜	46⅛	45⅝	46⅛	45¾	47⅛	46	47	45¾	228,203
Sunday Creek Coal	....	....	....	....	....	....	....	....	....	....	....	....	....	.....
Do. pref	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
Tennessee C. & I. Co	....	40⅛	39¼	39¼	38¾	40	....	39	....	40⅜	39¾	40¼	39	8,515
Do. pref	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
Westmoreland Coal	....	....	....	....	....	....	....	....	....	....	....	....	....	.....

**Of the sales of this stock, 41,278 were in Philadelphia, and 184,935 in New York. Total sales 425,065.

San Francisco Mining Stock Quotations.

COMPANY	CLOSING QUOTATIONS. July 5.	July 6.	July 8.	July 9.	July 10.	July 11.
Alpha	....	....	.35	....	....	.....
Alta	....	....	....	1.30	1.30	1.25
Belcher	....	....	....	....	....	.....
Belle Isle	....	....	....	....	....	.30
Best & Bel	....	....	3.40	3.05	3 05	3.00
Bodie	....	....	1.20	....	1.10	.....
Bulwer	....	....	.35	....	.30	.....
Cholliar	....	....	1.60	1.50	1.90	1.35
C'm'weal'h	....	....	4 05	4.00	3.85	.....
Con. C. & V	....	....	7.81	7..0	7.50	7.50
Con. Pac	....	....	....	....	....	.....
Crown Pt	....	....	2.35	2 20	2.25	2.00
Eureka C	....	....	2.00	....	....	.....
Gould & C	....	....	2.05	1.85	1.95	2.00
Grd. Prize	....	....	....	....	....	.....
Hale & N	....	....	3.10	2.90	3.05	3.00
M. White	....	....	....	....	....	.....
Mexican	....	....	3.25	2 90	2.90	3.00
Mono	....	....	....	.90	.75	.75
Mt Diablo	....	....	....	....	....	.....
Navaj	....	....	.40	....	....	.45
Nev. Queen	....	....	....	1.35	1.30	1.70
N. Belle I	....	....	1.25	1.25	1.10	1.45
Occidental	....	....	1.60	1.65	1.69	1.80
Ophir	....	....	5.13	4 65	4.50	4.00
Potosi	....	....	1.60	1.55	1.55	2.50
Savage	....	....	1.80	1.75	1.70	1.80
Sierra Nev	....	....	2 40	2.40	2 25	2.35
Union Con	....	....	3.15	2.95	2.95	2.95
Utah	....	....	.85	.80	.75	.75
Yellow Jkt	....	....	3.00	2.80	2.90	2.90

STOCK MARKET QUOTATIONS.

Baltimore, Md.

COMPANY.	Bid.	Asked.
Atlantic Coal	$1.00	....
Balt. & N. C.	.05	.25
Conrad Hill	....	.15
Cons. Coal	.22	.26
Diamond Tunnel	....	.50
George's Crk. C.	....	1.10
North State (Balt.)	.20	.25
Silver Valley	.40	....

Prices bid and asked during the week ending July 10th.

Birmingham, Ala. July 3.

COMPANY.	Bid.	Asked.
Ala. R. Mill Co.	....	$60
Ala. Con. C. & C. Co.	....	$30
*Alice Furnace.	$102	....
Anna Howe G. Mg. Co.	$⅝	$⅝
Bess. Land Co.	$22	$23
Bir. Fur. & Mg.	....	$14½
Bir. Mg. & M g.	....	$144
Broken Arrow.	$3	$3¾
De Bardeleben C. & I. Co.	$50	$55
Decat. L. Imp.	$9¼	$10½
DecaturMin. L.	....	$25
Enterprise Mfg.	....	$35
*Eureka	....	$11¾
Hen. S. & M. Co.	$70	$100
Jagger Towley C. & C.	....	$11@$11½
Mag-Ellen	$96	....
*Mary Pratt	$100	$100
Sloss I. & S.	$42¾	$44
†Sloss I. & S.	$94	$9 ½
††Sloss I. & S.	....	$66
Tuscaloose C., I. & L. Co	$20	....
Tenn. C. & I. Co.	$37¾	....
*Williamson	....	....
Woodstock I. Co.	$57½	$58¾

Prices bid and asked during week ending June 26th.

* Bonds. † First mortgage. †† Second mortgage.

Kansas City. July 2.

Company.	Par value.	Bid.	Asked.
Burch, L. & Z., Mo.	$ 1	$....	$.40
Ida Hill, S., N. Mex.	100	.10	100.00
K. C., Colo.	....	....	1.00
Kentucky, Z., Mo.	1	....	.20
La Motte, Mo.	100	98.00	100.00
Maverick, S., Colo.	10	.97	1.00
Minnequa Zinc	....	....	.20
Sonora, G. & S., Mex.	10	1.00	1.02
Standard, S. S., Colo.	....	11.00	....
Templar, N. Mex.	1	....	.15
Webb City, L. Z., Mo.	5	5.50	....
Wichita, L. Z., Kan.	100	....	40.00
Granite	....	....	....

Pittsburg, Pa.

COMPANY.	H.	L.	Closing
Allegheny Heat. Co.	....	....	....
Bridgewater Gas Co	*52.00	*42.00	48.00
Chartiers Val. Gas.	50 00	48.00	50.00
Charlotte Mg.	3.00	2.50	2 50
Forest Oil Co.	400 00	200 00	400.00
La Noria Mining	1.87	1.63	1.87
Mfg. Gas Stock	40.00	25.00	40.00
Nat. Gas Co. of W. Va	67 25	68 25	68.00
New York & C. Gas Co	36 00	34.00	34.00
Ohio Valley Gas.	35.00	35 00	35.00
Penn. Gas Co	15.00	14.50	15.00
People's N. G. & P. Co.	18.00	17.50	18.00
Philadelphia Co.	38.00	37.87	38.00
Silverton Mg Co.	1.00	1.00	1.00
South Side Gas.	26 00	25.00	25 00
Tuna Oil	68.00	....	68.00
Union Gas	60.00	51.00	60.00
Washington	80.00	72.50	80.00
West & Cambria.	35.00	15 00	35.00
W'house A. B Co.	118.00	115.00	117.00
W'house B. Co.	*17.75	*31.50	*17.75
W'house E. Light.	*51.00	*51.00	*51.00
Wheeling Gas.	30.00	29.13	29.00
Yankee Girl	1.00	....	1.00

Sales during the week ending July 10:

Nat. Gas, W. Va.	20 shs.	$38 00@37.50
People's N. G. & P. Co	25 "	.....@17 63
Philadelphia Co.	2 3 "	38.00@37.00
W'house B. Co.	375 "	47.75@31.80
Westinghouse	75 "	51.50@.....
Wheeling Gas	70 "	29.25@.....

*Actual selling price.

St. Louis. July 10.

CLOSING PRICES.

	Bid.	Asked.
Adams, Colo	$ .30	$ .31¼
Anderson, Mont.	.15	....
Arizona	.08½	.09½
Aztec, N. Mex.	.38¾	.41¼
Bi-Metallic, Mont.	....	....
Black Oak, Cal.	.30	.32½
Black Spar	.03	.03¾
Bremen, N. Mex.	....	....
Buckskin	.05	.10
Carriboo, Idaho	.7½	.08
Central Silver	....	.26¼
Cleveland, Colo.	....	....
Concepcion, Mex.	....	....
Dinero, Colo	....	....
Golden Era, Mont.	.42½	.45
Golden King	.37½	.40
Golden West	....	1.00
Gold Run	.05½	.06½
Granite Mountain, Mont.	....	....
Hope, Mont.	....	....
Ingram	....	....
Ivanhoe, Colo.	.50	.62½
I. X. L., Colo.	.17½	.18¾
Jumbo, Colo.	.08	.09
Keystone	....	....
La Union	.03	.04
Little Giant	.17½	.18¾
Mary Foster, Colo.	.00¾	.01
Major Budd, Mont.	.22	.23¾
Mexican Imp., Mex.	....	....
Montrose Placer	.75	....
Mountain Key	1.30	1.35
Neath, Colo.	.17½	.22½
Old Colony	....	....
Pat Murphy, Colo.	.28½	.30
Phillips, Colo	.90	.95
Queen of the West, Idaho	.21¼	.23¾
Rena	.03	.04½
San Francisco, Mont.	.27½	.28¾
San Pedro	.17½	.18¾
Small Hopes, Colo.	1.35	1.50
Silver Age, Colo.	....	6.00
Silver Bell	....	....
Tourtelotte, Colo.	.50	.53¾
West Granite, Mont.	.75	.76¾
Wire Patch	....	....
Yuma, Ariz.	.32½	.33¾

Auction Sales of Stocks.

The following securities were sold at public auction in New York last week:

500 shares Cameron Iron and Coal Co. $25 lot

490 shares Stout Electric and Storage Battery C. 16 "

Electric Stocks. July 12.

The following closing quotations are reported to-day by J. Heron Crosman, New York City:

Stocks.	Par value.	Market price.
Brush	$ 50	$65 @ $85
" Illuminating	100	70 @ 75
Daft	100	45 @ 55
Consolidated	100	65 @ 70
Edison	100	185 @ 190
" Illuminating	100	90 @ 95
Julien	100	20
" Traction	....	10 @ 13
United States	100	50 @ 60
" Illuminating	100	50 @ 60
Westinghouse	50	45 @ 49½
Thomson-Houston	....	....
Thomson-Hous. Welding Co.	....	....

Trust Stocks. July 12.

The following closing quotations are reported to-day by C. I. Hudson & Co., m mbers New York Stock Exchange:

American Cotton Oil Certificates	$53⅝@$53¾
Sugar Refineries Certificates	109 @109½
Distillers' & Cattle Feeders' Certificates	43 @ 45
Linseed Oil Certificates	.....@.....
Natural Gas "	110 @120
Standard Oil "	169 @170½
National Lead "	25½@ 25⅝
Cattle Trust "	15⅛@ 16⅛

During the week ending July 12th the following sales were made at the New York Stock Exchange:

	Sales.	Price H.	Price L.
Am. Cattle Trust	739	18⅞	16
American Cotton Oil Certificates	21,635	56¾	55¼
Cattle Feeders' Trust	3,969	44½	42
National Lead Trust	67,579	32⅞	29¾
Sugar Trust	38,433	117¾	108½

Foreign Quotations.

COMPANY.	London. Highest.	London. Lowest.
Alturas Gold, Idaho	....	....
Arizona Copper, Ariz.	18s. 6d.	18s.
Callao Bis, Venz	....	....
Carlisle, N. Mex	3s.	2s.
Colorado United, Colo.	....	....
Columbian, S. A.	£2½	£1⅞
Comstock, Utah	....	....
Cons. Esmeralda, Nev.	3s.	2s.
Denver Gold, Colo.	2s.	1s. 6d.
Dickens Custer, Idaho.	2s. 6J.	3s. 6d.
Eberhardt, Nev	....	....
El Callao, Venezuela	£3¼	£2¾
Elmore, Idaho	....	....
Empire, Mont	£1-16	£1-16
Flagstaff, Utah	1s. 3d.	9d.
Garfield, Nev	6s.	4s.
Hambley Freehold N.C.	....	....
Ilex, Cal	£⅜	£⅛
Jay Hawk, Mont	....	....
Josephine, Cal	9s.	7s.
Kohinoor, Colo.	4s.	3s.
Mason & Barry, Port.	£6⅛	£5⅞
Montana Lt., Mont	£1 13-16	£1 11-16
New California, Colo.	....	....
New Consolidated	....	....
New Emma, S., Utah.	....	....
New Hoover Hill, N. C.	5s.	4s.
New La Plata, Colo.	2s. 6d.	1s 6d.
Old Lout, Colo.	....	....
Pittsburg Cons. Nev.	13s 9d.	11s. 9d.
Quebrada, Venezuela	....	....
Richmond Con., Nev.	£2	£1¼
Ruby & Dunderberg, Nev	1s.	6d.
Russell Gold, N. C.	....	....
Sierra Buttes, Cal.	£11-16	£9-16
Stanly, N. C	4s.	2s
United Mexican, Mex.	£7-16	£5-16
U. S. Placer, Colo.	3s.	2s.
Viola Lt., Idaho	2s. 6d.	1s. 6d

Paris. June 27.

Belmez, Spain	540.00	540.00
Boleo, Mex	365.00	345.00
Callao Bis, Venez	4.00	4.00
East Oregon, Ore.	47.50	47.50
Forest Hill Divide, Cal.	350.00	350.00
Golden River, Cal	390.00	390.00
" " parts	60.00	60.00
Lexington, Mont.	143.75	143.75
" parts	4.50	4.50
Ouray, Colo.	55.00	50.00
Rio Tinto, Spain	280.00	280.00
Tharsis, Spain	89 00	89.00

CURRENT PRICES.

These quotations are for wholesale lots in New York.

CHEMICALS AND MINERALS.

Acid—Acetic, ℔ 100 lbs. $2.00
Muriatic, 18°, ℔ 100 lbs 1.10@1.20
Muriatic, 20°, ℔ 100 lbs. 1.35@1.50
Nitric, 36°, ℔ 100 lbs 4.00@5.50
Nitric, 42°, ℔ 100 lbs. 5.50@7.00
Oxalic, ℔ 100 lbs. 9.50@10.50
Sulphuric, 60°, ℔ 100 lbs. 90@95
Sulphuric, 66°, ℔ 100 lbs 95@1.25

Alkali—36 p. c. 1.20 @1.25
Refined, 48 p. c 1.22½@1.25
Refined, 58° 1.15@1.20

Alum—Lump, ℔ lb. 1¾
Ground, ℔ lb. 1¾@2
Lump ℔ ton, Liverpool £4 17 6
Sulphate of Alumina, ℔ ton £4 10

Aqua Ammonia—18°, ℔ lb. 4¾
20°, ℔ lb. 6
22°, ℔ lb. 6@7
26°, ℔ lb. 10@11

Ammonia—Sul., ℔ 100 lbs. 3.12½
Carb., per lb. 7½@8½
Muriate per lb. 6½@ 8

Arsenic—White, powdered, ℔ lb. 3@3½
Red. ℔ lb 7@8
White, at Plymouth, ℔ ton. £12 2 6d.

Asbestos—Am., p. ton $50@$300
Italian, p. ton, c. i. f. L'pool £18@£60

Asphaltum—P. ton 13.00
Prime Cuban. ℔ lb. 4½@5½c.
Hard Cuban, ℔ ton $28.00
Trinidad. refined, ℔ ton $30.00

Barytes—Sulph., Am. prime white 16@20
Sulph., foreign, floated, p. ton 20@21
Sulph., off color, p. ton 13.00
Carb., lump, f.o.b. L'pool, ton £6

No. 1, casks, Runcorn " " £4 10 0
No 2, bags, Runcorn " " 3 15 0

Bleach—Over 35 p.c., ℔ lb. 1.50@1.75

Borax—℔ lb 9¼
Refined at Liverpool, ℔ ton £29

Brimstone—*See Sulphur.*

Bromine—℔ lb. 37@38

Chalk—℔ ton 3.25@3.50
Precipitated, ℔ lb. 4¾@5

China Clay—English, ℔ ton 13.50@18.50
Southern, ℔ ton 13.50

Chrome Yellow—℔ lb 10@25

Cobalt—Oxide, ℔ lb. 2.60@2.90

Copper—Sulph. English Wks., ton £24
Precip., Eng. Wks, unit. fluctuating

Copperas—Common, ℔ 100 lbs. 52@57½
Best, ℔ 100 lbs. 75@1.00
Liverpool, ℔ ton, in casks £1 15s.

Cream of Tartar—Am. 99% 23
Powdered, 99 p c. 24½

Emery—Grain, ℔ lb 4½@5
Flour, ℔ lb 3¾@4½

Feldspar—Ground, ℔ ton. 15.00

Fuller's Earth—Lump, ℔ bbl. .90@95
Powdered, ℔ lb. 1¾@2

Gypsum—Calcined, ℔ bbl. 1.25

Iodine—Resublimed 3.50

Kainit—℔ ton 9.75@11.00

Kaolin—*See China Clay.*

Lead—Red, ℔ lb. 6¾@7
White, American, in oil, ℔ lb. 6¾@7¼
White, English, ℔ lb 8½@8¾
Acetate, or sugar of 12@13

Lime Acetate—Amer. Brown. .95@1.00
" Gray 1.75@1.87½

Litharge—Powdered, ℔ lb. 6½@6¾
English flake, ℔ lb. 9@9½

Magnesite—Greek, ℔ ton. 20.00

Manganese—Crude, per unit .23@.28
Oxide, ground, per lb 2½@6½

Mercuric-Chloride—(*Corrosive Sublimate*) ℔ lb. 67@69

Mineral Wool—℔ lb. 2

Mica—In sheets according to size, 1st quality. ℔ lb. .25@$6 00

Ochre—Yellow, "B. F.," ℔ ton, f.o.b. mill 30.00
"J. F. L. S.," ℔ lb, ex dock 2½

Phosphate Rock—S. Carolina, per ton f. o. b. Charleston 5.50@6.00
Ground, ex vessel New York 11.00
Canadian Apatite, lump, f. o. b. at Montreal, ℔ ton 16.00

Phosphorus—℔ lb. 70@75

Plumbago—Ceylon, ℔ lb. 4@5
American, ℔ lb. 5@7

Potassium—Cyanide, ℔ lb. .30@40
Bromide, ℔ lb. 33
Chlorate, ℔ lb. 13¾@15½
Carb. ℔ lb. 4.70@5.50
Caustic, ℔ lb. 7½@8
Iodide. 2.70@2.75
Muriate, ℔ 100 lbs. 1.80
Nitrate, refined, ℔ lb. 6@8
Bichromate, ℔ lb 11½@12
Sulphate, ℔ 100 lbs. 2.30@2 35
Yellow Prussiate, ℔ lb. 17½@18
Red Prussiate, ℔ lb. 42@45

Pumice Stone—Select lumps, lb. 3¼
Original cks., ℔ lb. 1¾
Powdered, pure, ℔ lb. 2¼@2½

Pyrites—Non-cupreous, p. un 10d.

Quartz—Ground. ℔ ton. 16.00

Rotten Stone—Powdered ℔ lb. 3@3½
Lump, ℔ lb. 6@10
Eng., powdered ℔ ton. £4
Lump, ℔ ton. £5

Salt—Liverpool, ground ℔ sack. 75@80
Turk's Island, ℔ bush. .25@27

Salt Cake—℔ lb. .50@57

Saltpeter—Crude, ℔ lb. 5¼@5½
Refined, ℔ lb. 6@8

Soda Ash—Carb., 48 % 100 lb. 1.22½@1.30
Caustic, 48 % 1.25
Soda Caustic, 60% 2 40
" " 70% 2.15
" " 74-6% 2.15
Sal, English, ℔ 100 lbs. .90
Sal, American, ℔ 100 lbs .80
Nitrate, ℔ 100 lbs. 1.95

Strontium—Nitrate ℔ lb. 9@9½

Sulphur—Roll, ℔ lb. 1¾
Flour, ℔ lb 2
Crude Brimstone, 2s., ℔ ton. 19.50
Crude Brimstone, 3ds, ℔ ton. 19.00

Talc—Ground French, ℔ lb. 1¼@1½
Domestic, ℔ lb. 1@1¼
c. i. f. Liverpool, ℔ ton £4 5

Vermillion—American, ℔ lb. 61
English, ℔ lb. 82@85

Vitriol—(Blue), Ordinary, ℔ lb. 5¾@6¾
Extra, ℔ lb. 7

Zinc Oxide—Am., Dry, ℔ lb. 4½
Antwerp, Red Seal, ℔ lb. 6@6½
Paris, Red Seal, ℔ lb. 6¾@7

* Spot.

THE RARER METALS.

Aluminum—(Metallic), ℔ lb. $4.00
Sheet, per lb. 6.00@8.00

Arsenic—Metallic, per lb. .20

Barium—(Metallic), per lb. 975.00

Bismuth—(Metallic), per lb. 2.40

Cadmium—(Metallic), per lb. 1.25

Calcium—(Metallic), per oz. 150.00

Cerium—(Metallic), per oz. 160.00

Chromium—(Metallic), per lb. 200 00

Cobalt—(Metallic), per lb. 6.00

Didymium—(Metallic), per oz. 160.00

Erbium—(Metallic), per oz. 140.00

Gallium—(Metallic), per oz 3250.00

Glucinum—(Metallic) per oz. 250.00

Indium—(Metallic), per oz. 158.00

Iridium—(Metallic), per lb. 650.00

Lanthanum—(Metallic), per oz. 175.00

Lithium—(Metallic), per oz. 160.00

Magnesium—Per lb. 4.50

Manganese—Metallic, per lb. 1.10
Chem. pure, per oz. 10.00

Molybdenum—(Metallic), per oz. 6.00

Niobium—(Metallic), per oz. 128.00

Osmium—(Metallic), per lb 640.00

Palladium—(Metallic), per lb. 400.00

Platinum—(Metallic), per lb. 140.00

Potassium—Metallic, per lb. 28.00

Rhodium—(Metallic), per lb. 512.00

Ruthenium—(Metallic), per oz. 112.00

Rubidium—(Metallic), per oz. 200.00

Selenium—(Metallic), per oz. 3.00

Sodium—(Metallic) per lb. 2.75

Strontium—(Metallic), per oz. 128.00

Tantallum—(Metallic) per oz. 144.00

Tellurium—(Metallic) per oz. 9.00

Thallium—(Metallic) per oz. 3.00

Titanium—(Metallic) per oz. 32.00

Thorium—(Metallic) per oz. 272.00

Tungsten—(Metallic) per oz. 4.00

Vanadium—(Metallic), per oz. 320.00

Yttrium—(Metallic), per oz 144.00

Zirconium—(Metallic), per oz. 240.00

BUILDING MATERIAL.

Bricks—Pale, ℔ 1,000 3 25@3.75
Jerseys, ℔ 1,000 5.00@5.50
Up Rivers, ℔ 1000 5 50@6.00
Haverstraw seconds, ℔ 1000 6.00@6.12½
Haverstraw firsts ℔ 1,000 6.25@6.50
Fronts, nominal, ℔ 1000.
Croton 14.00@16.00
Wilmington 20.00@21.00
Philadelphia @22.00
Trenton @22.00
Baltimore

Building Stone—Amherst freestone, ℔ cu. ft. 95@1.00
Brownstone, ℔ cu. ft. 1.00@1.35
Granite, rough, ℔ cu.ft. 45@1.25
Granite, Scotch ℔ cu. ft. 1.00@1.15

Cement—Rosendale, ℔ bbl .90@1.10
Portland, American, ℔ bbl. 2 15@2.45
Portland, foreign, ℔ bbl. 2 30@2.40
Portland, " special brands. 2.45@3.75
Roman, ℔ bbl. 2.65@2.85
Keene's coarse, ℔ bbl. 4.50@5.50
Keene's fine, ℔ bbl. 7.00@8.25

Slate—Purple and green roofing, ℔ 100 ft.
Red roofing, ℔ 100 sq. ft. 10.00@15.00
Black, roofing, ℔ 100 sq. ft. 4.50@5.25

Lime—Rockland, common ℔ bbl. 1.00
Rockland, finishing, ℔ bbl. 1.20
St. John, com. and finish, ℔ bbl. .90@.95
Glens Falls, com. and fin., ℔ bbl .85@1.10

Labor—Ordinary, ℔ day 1.50@2.00
Masons, ℔ day 4.00
Plasterers, ℔ day 4.00
Carpenters, ℔ day 3.50
Plumbers, ℔ day 3.50
Painters, ℔ day 2.50@3.50
Stonesetters, ℔ day 3.50@4.00
Tilelayers, ℔ day 3.50@4.50
Bricklayers, ℔ day 4 00

THE ENGINEERING AND MINING JOURNAL will thank any one who will indicate any other articles which might with advantage be quoted in these tables or who will correct any errors which may be found in these quotations.